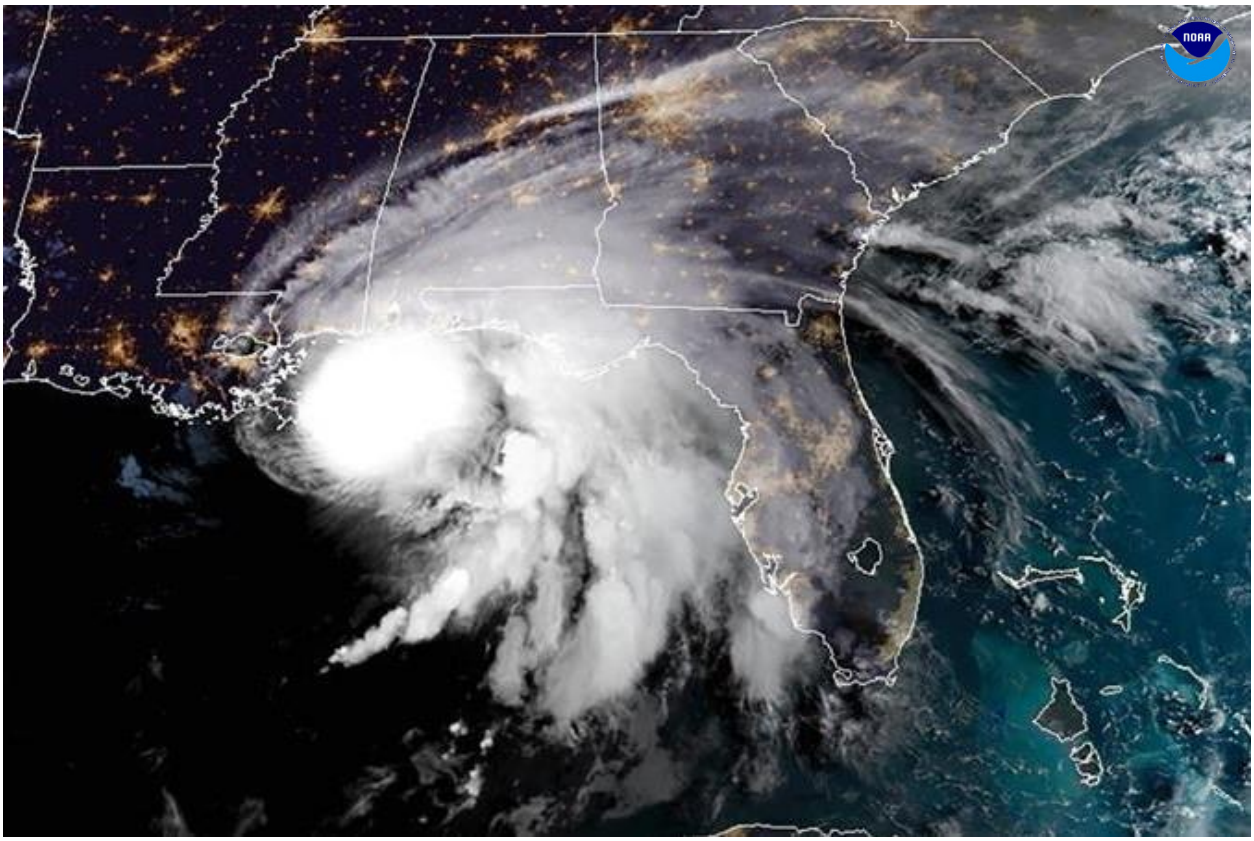

NOAA
National Ocean Service (NOS) Hurricane Preparedness Summit 2021

June 21 & 23, 2021

I. Table of Contents

II. Acronyms

AOC	NOAA OMAO Aircraft Operations Center
ARK	UTMSI Amos Rehabilitation Keep
CAPT	Captain
CDR	Commander
COOP	Continuity Of Operations Planning
CO-OPS	NOAA Center of Operational Oceanographic Products and Services
CRRC	Coastal Response Research Center
DCD	Disaster Coordination Dashboard
DPP	NOAA Disaster Preparedness Program
DRC	Gulf of Mexico Disaster Response Center
ENS	NOAA Emergency Notification System
ENSO	El Niño Southern Oscillation
ERD	NOAA OR&R Emergency Response Division
ERMA	Environmental Response Management Application
ESF	Emergency Support Function
FEMA	U.S. Federal Emergency Management Agency
GOHSEP	Governor's Office of Homeland Security and Emergency Preparedness (Louisiana)
HSPO	NOAA Homeland Security Program Office
IMT	NOAA Incident Management Team
LCDR	Lieutenant Commander
LT	Lieutenant
MA	Mission Assignment
MEF	Mission Essential Function
MOC-A	NOAA OMAO Marine Operations Center - Atlantic
NERRA	National Estuarine Research Reserve Association
NGS	NOAA National Geodetic Survey
NHC	NOAA NWS National Hurricane Center
NOAA	U.S. National Oceanic and Atmospheric Administration
NOS	NOAA National Ocean Service
NRT	NOAA Navigation Response Team
NWS	NOAA National Weather Service
OCM	NOAA Office for Coastal Management
OMAO	NOAA Office of Marine and Aviation Operations
ONMS	NOAA Office of National Marine Sanctuaries
OR&R	NOAA Office of Response and Restoration
PMI	Personnel, Mission, and Infrastructure
RRT	Regional Response Team
RV	Recreational Vehicle
SECART	NOAA Southeast and Caribbean Regional Team
SOP	Standard Operating Procedure
SSC	NOAA Scientific Support Coordinator

SST	Sea Surface Temperature
UNH	University of New Hampshire
U.S.	United States
USCG	U.S. Coast Guard
USPHS	U.S. Public Health Service
UTMSI	University of Texas at Austin Marine Science Institute
WFO	Weather Forecasting Office

III. Acknowledgements

This summit and report were supported by the National Oceanic and Atmospheric Administration's (NOAA) Office of Response and Restoration (OR&R) Disaster Preparedness Program (DPP) and the University of New Hampshire's (UNH) Coastal Response Research Center (CRRC). The content for the summit was developed in cooperation with NOAA DPP and the following Organizing Committee members:

- Nancy Kinner, UNH CRRC
- Charlie Henry, NOAA OR&R DPP and Gulf of Mexico Disaster Response Center (DRC)
- Brad Benggio, NOAA OR&R Emergency Response Division (ERD)
- Lisa Symons, NOAA Office of National Marine Sanctuaries (ONMS), Florida Keys National Marine Sanctuary
- Jeffrey Cupo, NOAA National Weather Service (NWS), Operational Services Division Southern Region
- LT John Kidd, NOAA Navigation Response Team (NRT)
- Matthew Chasse, NOAA Office for Coastal Management (OCM)
- LCDR Megan Guberski, NOAA Navigation Response Team (NRT)
- Cory Rhodes, NOAA Gulf of Mexico DRC
- Katie Perry, UNH CRRC

This summit was facilitated by Nancy Kinner (www.crrc.unh.edu). CRRC is known globally as an independent intermediary that brings all stakeholders to the table to develop and implement viable and trusted solutions to complex problems related to environmental disasters. CRRC has conducted 70+ workshops that bring together practitioners, researchers, and scientists of diverse backgrounds (e.g., industry, academia, government, NGOs) to discuss and develop solutions to marine pollution and disaster problems.

We would like to thank each of the speakers for their participation in the workshop:

- Paul Scholz, Acting Deputy Assistant Administration, NOAA National Ocean Service (NOS)
- Scott Lundgren, Director, NOAA OR&R
- Cody Fritz, NOAA NWS National Hurricane Center (NHC)
- CAPT Christian Rathke, Director, U.S. Public Health Service (USPHS) Office of Health Services and Staff Officer Support
- Kennard 'Chip' Kasper, NOAA NWS Weather Forecasting Office (WFO) Key West, FL
- CDR Matthew Jaskoski, NOAA OMAO Marine Operations Center – Atlantic (MOC-A)
- CDR Chris 'Bubba' Sloan, NOAA OMAO Aircraft Operations Center (AOC)
- Keith Laakkonen, National Estuarine Research Reserve Association (NERRA)
- Savannah Turner, NOAA OR&R DRC
- Lauren Nash, NOAA NWS WFO Slidell/New Orleans, LA
- Geno Olmi, NOAA Southeast and Caribbean Regional Team (SECART)
- Melissa Woehle, Florida Department of Environmental Protection, Office of Emergency Response
- Mike Aslaksen, NOAA National Geodetic Survey (NGS), Remote Sensing Division

- Adam Davis, NOAA OR&R ERD
- Jason Rolfe, NOAA OR&R Marine Debris Program
- Steve Goldstein, NOAA NWS, NOAA Liaison to FEMA Headquarters
- Kate Wheelock, NOAA OR&R DPP
- Randy Ashmore, Gallagher Marine
- LCDR Kasey Arguelles, U.S. Coast Guard (USCG), Safety and Environmental Health Division
- CDR Kenneth J. "KJ" Green, Director, NOAA OMAO Behavioral Health and Wellness, USPHS
- Jace Tunnell, University of Texas at Austin Marine Science Institute (UTMSI) Amos Rehabilitation Keep (ARK)
- Jeffry Evans, NOAA NWS WFO Houston/Galveston, TX
- Paul Fanelli, NOAA Center of Operational Oceanographic Products and Services (CO-OPS)
- Doug Helton, NOAA OR&R ERD
- LCDR Erica Brewton, USCG Sector Mobile, AL
- Jonathan Gordon, NOAA ONMS
- Melton 'Mel' Gaspard, Louisiana's Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP)
- Chief James 'Nick' Russo, Senior Type-1 Supervisor Field Leader Cadre, Federal Emergency Management Agency (FEMA)
- CAPT Anne Lynch, Director, NOAA Homeland Security Program Office (HSPO)

A special thank you to (1) Kathy Mandsager (UNH CRRC), Quinn Wilkins (UNH CRRC), Katie Denman (NOAA ONMS), Zac Cannizzo (NOAA ONMS), and Justin Umholtz (NOAA ONMS) for their efforts in coordinating the virtual summit, and (2) Tori Sweet (UNH CRRC), Jessica Manning (UNH CRRC), Wesley Lambert (UNH CRRC), and August Murray (UNH CRRC) for their notetaking during the summit.

IV. Executive Summary

On June 21 and 23, 2021, CRRC and DPP co-sponsored a virtual event entitled "NOS Hurricane Preparedness Summit." The purpose of the summit was to put NOAA in a better posture for the 2021 hurricane season by identifying current best practices, lessons learned, and future challenges. The summit agenda is included as **Appendix A**. On Day 1 and 2 of the summit, there were 142 and 117 attendees; respectively. Participants represented academia, federal, state, and local agencies.

Specific objectives were to better understand:

1. Best practices and lessons learned from the 2020 hurricane season;
2. Personnel, Mission, and Infrastructure (PMI) topics;
3. Methods to improve consistency in response between federal and state partners;
4. Future challenges for the 2021 hurricane season; and
5. Gaps in hurricane preparedness and response given the pandemic limitations.

The two-day summit included plenary presentations from academics, federal and state agency representatives outlining: preparedness, response, and virtual and in-person incident command lessons learned; emergency support function (ESF) 3/10 response gaps; the NOAA/FEMA perspective to hurricane preparedness and response; managing pandemic fatigue; unreliability and/or loss of utilities; coordinating deployment logistics; and anticipated challenges and mitigation methods for the 2021 hurricane season. Presentation slides are in **Appendix B.** Question and answer sessions were included throughout the summit, as well as polling questions to obtain feedback from participants.

Common themes emerged from discussions during the summit including:

- NOAA and partner facilities may not be resilient to storm impacts, specifically from hurricanes. The loss of essential utilities (i.e., power, water) at NOAA or partner facilities impacts their ability to respond to ESFs and other response and recovery activities during a hurricane.
- Staff health, fatigue, and burnout are ongoing concerns for the hurricane preparedness and response community.
- As the workforce transitions between telework and on-site workspaces, challenges in telework policy, communication, and resources remain unresolved.
- The need to improve ESF 3/10 response coordination, consistency, and implementation.
- Many NOAA line offices have their own internal situational awareness boards, but there is no combined board to ensure broad agency-wide awareness and interagency coordination during a collaborative response, such as an oil spill.

CRRC and DPP contracted the UNH Survey Center to conduct a survey with stakeholders prior to the summit. The 13-question survey received 135 responses between April 7 and 15, 2021. The survey inquired about general demographics (i.e., organization name, NOAA line office, region), hurricane preparedness and response plans, best practices, Mission Essential Function (MEF)/ESF roles, anticipated challenges, and the extensiveness of the identified challenges for the 2021 hurricane season (substantial, moderate, minor). More information about the survey and the results can be found in the pre-summit survey technical report (**Appendix C**).

V. Summit Day 1

Day 1 of the summit, held on June 21, 2021, focused on preparedness, response, and recovery lessons learned in the 2020 hurricane season from different NOAA line office representatives. Speakers shared examples of best practices used to overcome hurricane related challenges and potential mitigation methods to new challenges from pandemic limitations. Introductory polls were used to understand the attendee's level of preparedness, priority concerns, and MEF/ESF roles.

Poll Question 1: Do you believe you are now more prepared for the 2021 hurricane season than you were for the 2020 season?

a. **Yes (84%)**
b. No (16%)

Poll Question 2: Which of the following are you MOST concerned with for the 2021 hurricane season? (select all that apply)

a. Keeping your people safe during response activities (25%)
b. **Having enough qualified personnel to respond (42%)**
c. Loss of partner relationships without face-to-face interaction (28%)
d. Managing the multiple aspects of pandemic and response related fatigue (30%)

Poll Question 3: Do you have a Mission Essential Function or Emergency Support Function role in hurricane response?

a. **Yes (65%)**
b. No (22%)
c. Unsure (12%)

Welcome and Summit Objectives

Nancy Kinner (UNH CRRC) provided the opening statements. Paul Scholz (NOS) and Scott Lundgren (OR&R) each provided a welcome and their perspective on the upcoming hurricane season. Charlie Henry (OR&R) reviewed the five summit objectives and the pre-summit survey results. The survey prioritized the most substantial challenges that agencies faced during the 2020 hurricane season which included: managing the multiple aspects of pandemic-related fatigue, complacency of others to follow COVID-19 safety guidelines, and unreliability/loss of utilities. The survey also indicated that keeping staff safe, maintaining access to adequate protection during response, having enough qualified personnel to respond, and continuity of operations planning (COOP) were additional limitations of the 2020 hurricane season.

Setting the Stage

Cody Fritz (NWS) set the stage for the summit by reviewing the record breaking 2020 hurricane season with 30 storms, 639 issued advisories, and 11 U.S. landfalls. Looking ahead to the 2021 hurricane season, Fritz noted that there is a 60% probability that the season will be above normal, but not as active as 2020, based on sea-surface temperatures (SST) and El Niño Southern Oscillation (ENSO). CAPT Christian Rathke (USPHS) then discussed NOAA's reintegration into the

workplace, effects of employee burnout, and updated science on COVID-19 transmission and vaccination.

Preparedness and Response Lessons Learned

Panelists provided preparedness lessons learned from the 2020 hurricane season based on their NOAA line office experiences. Chip Kasper (NWS) detailed the NWS challenges with teleworking in an office that previously had not allowed telework and didn't have any infrastructure or procedures in place to support telework. Since the agency provides 24/7 support, teleworking resulted in a radical culture change at the agency. CDR Matthew Jaskoski (OMAO) provided insight into the operational capacity of MOC-A noting that all ships are operational for 2021 but maintain some level safety protocols (i.e., regular testing, teleworking, shelter in place). Additionally, shore support facilities are at minimum staffing levels and COOP are unchanged from years past. The pandemic, coupled with the 2020 record breaking hurricane season, impacted the mental health of many response teams. AOC logged 678 flight hours in 2020 and CDR Chris Sloan (OMAO) discussed how MOC-A updated protocols to allow for more operational flexibility and to account for mental health impacts of response operations on staff. Keith Laakkonen (NERRA) discussed the 2020 hurricane impacts to facilities and research vessels in Florida, focusing on Rookery Bay National Estuarine Research Reserve. To prepare for the 2021 hurricane season, Laakkonen made improvements to existing infrastructure to withstand the impacts from hurricanes (e.g., sand anchors into the beach to keep vessels in place). Savannah Turner (OR&R) detailed the measures used by the Gulf of Mexico DRC to provide a safe and ready command center for USCG COOPs and mission support during Hurricane Sally in 2020. Turner highlighted COVID-19 testing and health protocols, increased communication and coordination with USCG incident management team's safety officers, regular briefs, and protocol enforcement.

A second panel focused on hurricane response and recovery lessons learned from the 2020 hurricane season. Lauren Nash (NWS) elaborated on the challenges that the NWS faced while integrating telework into routine operations. Nash noted that different offices within the NWS approached teleworking differently, some with great success, highlighting the importance of communication between different regional offices to share best practices. Geno Olmi (SECART) discussed the multi-year collaborative effort with SECART and DPP/DRC to improve NOAA's resilience by hosting workshops, exercises, and trainings. The outcomes of these programs identified the need for: a regional "guide" detailing NOAA's roles and contact information; widespread sharing of resources (e.g., emergency plans, COOPs, equipment, backup personnel); more developed methods on incident stress management; clear guidance from offices, including emergency notification system messages; and a defined role for Regional Collaboration Teams, if any, in coordination before/during/after a disaster. Melissa Woehle of Florida's Department of Environmental Protection discussed best practices which included: developing recovery-specific Standard Operating Procedures (SOPs), creating redundancy by cross training personnel to have multiple people capable of responding, and conducting smaller, internal exercises. Mike Aslaksen (NGS) provided an overview of emergency response imagery and shared the challenges of hurricane response and recovery activities during the pandemic such as limited personnel and flexibility of base operations, and decentralized support. Aslaksen noted that the office has a culture of "train like you fight" which has enabled missions to be accomplished, even with limitations.

Emergency Support Function (ESF) 3/10

NOAA OR&R presenters discussed different aspects of responding to ESF 3/10 mission assignments during the pandemic. NOAA SSC, Brad Benggio introduced recommended improvements to ESF 10 for hurricane response and described the outcomes of an ongoing ESF 10 workgroup comprised of NOAA DPP, NOAA ERD, and USCG members with representation from USCG District 7, USCG District 8, and the National Pollution Funds Center. The workgroup produced a document entitled 'Coordination Objective for Reviewing and Improving Emergency Support Function (ESF) 10 Hurricane Response', which outlines six recommendations to improve preparedness, consistency, and coordination efforts for ESF 10 hurricane responses.

1. Develop clear and consistent guidance for coordinating ESF 3 and ESF 10 assessment, response, and recovery operations.
2. Identify long term ESF 10 response activities as either emergency response or recovery operations to determine the right size response effort including the number of assets and agencies involved.
3. Conduct post-response reviews with federal and state partners to discuss lessons learned and recommended improvements.
4. Understand the ESF 10 response needs for each of the five phases of response, identified by NOAA ERD, to improve preparedness efforts.
5. Understand the drivers from states to request FEMA support.
6. Work with state agencies, EPA, and FEMA to assemble filed data collection processes, data management tools, and improve common operating pictures to increase the efficiency of response.

NOAA SSC Adam Davis provided the perspective of NOAA's pollution response support and described examples of consistent challenges in response efforts such as: evolving state decision making processes; inconsistencies across regions for criteria for debris removal, data management and sharing, and size of response crews; and lack of contingency planning. Davis presented best practices learned from the record breaking 2020 hurricane season such as the importance of post storm imagery and the need to standardize imagery visualization and analysis, assessments, data collection, and data management.

Jason Rolfe (OR&R) discussed NOAA marine debris support to ESF 3 by providing a background of NOAA's marine debris program, goals of the program, published response guides, the program's role in emergency response, and the status of relevant projects.

NOAA/FEMA Perspective

The NOAA NWS has a Liaison Officer located at FEMA headquarters. The Liaison provides situational awareness of high-impact meteorological, hydrological and space weather events of national significance to FEMA at daily operations briefings. FEMA is prepared for the 2021 hurricane season and is working through ongoing challenges due to supply shortages (e.g., rental cars, temporary power, tablets, equipment), changes in staff, and staff shortages.

VI. Summit Day 2

Day 2 of the summit, held on June 23, 2021, focused on lessons learned for managing fatigue, addressing unreliable utilities, conducting incident command, and coordinating deployment logistics in the 2020 hurricane season and best practices for the 2021 season. Polls were used throughout the summit to understand challenges associated with loss of utilities and the impacts on COOP.

Poll Question 1: Did you have challenges in past hurricane seasons with loss of utilities and/or COOP?

a. **Yes (44%)**
b. No (38%)
c. Not Applicable (18%)

Poll Question 2: Do you have contingencies for dealing with loss of utilities and/or COOP for this year's hurricane season?

a. **Yes (69%)**
b. No (17%)
c. Not Applicable (14%)

Poll Question 3: After listening to the panelists, do you feel like there are additional best practices you could implement?

a. **Yes (94%)**
b. No (6%)

Managing Pandemic Fatigue

Two-thirds of pre-summit survey respondents anticipated that managing pandemic fatigue will be a challenge for the 2021 hurricane season; 13% of respondents identified mitigation strategies. Among the respondents who anticipated managing fatigue as a challenge, 91% viewed it as a substantial/moderate challenge and 9% viewed it as a minor challenge.

Panelists discussed potential causes of workplace burnout, the challenges of pandemic-related fatigue, and possible mitigation methods for managing fatigue and stress. Randy Ashmore (Gallagher Marine) used the *MV Golden Ray* salvage operation in St. Simons Sound, GA as an example to discuss fatigue mitigation strategies used in the large-scale response operation during the pandemic. Ashmore used information provided by reputable sources (e.g., CDC, World Health Organization (WHO), local hospitals) to conduct daily staff briefings and reminded his staff to "stay safe, stay healthy, and smile often." In a recent research study, LCDR Kasey Arguelles (USCG) identified 17 psychosocial hazards that USCG responders were exposed to and the relationships between response factors and the identified hazards. Arguelles concluded that higher stress levels were associated with workers who responded to natural disasters; were non-supervisors; worked in operations, temporary assignments, and/or incident command; and worked more than 16-hour shifts. The study, while focused on USCG personnel, is applicable to all responders in similar situations. KJ Green (USPHS) described a conceptual model, the Hierarchy of Controls Applied to NIOSH Total Worker Health which describes efforts to promote the safety, health, and well-being of workers. The model prioritizes methods from most effective (1) to least effective (5): (1) **eliminate** working conditions that threaten worker safety, health, and well-being, (2) **substitute** health-

enhancing policies, programs, and practices, (3) **redesign** the work environment for safety, health, and well-being, (4) **educate** for safety and health, and (5) **encourage** personal change. Green also noted that NOAA Behavioral Health and Wellness provides mental health resources to NOAA and non-NOAA staff including direct services on a case-by-case basis, education and training, peer support programs, and policies and SOPs.

Case Studies: Unreliability or Loss of Utilities and COOP

For this panel, the speakers used case studies to illustrate how the loss of utilities impacted routine operations, rescue missions, and response. Jace Tunnell (UTMSI) described the impacts of the 2021 winter storm in Texas, that resulted a power outage and subsequent pipe freezing during a rehabilitation effort of stranded sea turtles. Learning from the experience, the facility purchased a generator and portable water tank to prepare for future events. Jeffry Evans (NWS) described the unreliability of utilities associated with the pandemic, hurricane season, and winter weather from March 2020 to March 2021. Some unexpected consequences of these events included loss of power for days, failing generators, water and plumbing outages, cell phone outages, limited salt for roads, and inability for staff to telework due to damage/loss of utilities at home. Evans concluded that these experiences showed that flexibility and communication were vital to ensure safety and continued operations.

Coordinating Deployment Logistics

Representatives from different NOAA line offices provided their perspective on coordinating deployment logistics during a normal hurricane season, lessons learned from the 2020 hurricane season, and plans for the 2021 hurricane season. LCDR Megan Guberski (OMAO) presented a National Response Team (NRT) timeline of a "perfect response" including monitoring efforts pre-storm to continued survey efforts post-storm. Guberski discussed the reintegration protocols and COVID-19 safety measures still in place for response operations (e.g., testing, masking, minimal boat crews). Regarding deployment lodging, the NRT used recreational vehicles (RVs) for deployed crews during the pandemic; a change that may continue post-pandemic. Paul Fanelli (CO-OPS) presented on how CO-OPS coordinates logistics for station repairs following tropical cyclones including collecting water level information, real-time station monitoring, and remotely troubleshooting stations. For the 2021 hurricane season, CO-OPS will continue to issue water levels for tropical cyclones; provide real time coastal flooding information though the Coastal Inundation Dashboard; and deploy CO-OPS field crews to repair mission critical stations. Doug Helton (OR&R) described how scientific support coordinators (SSCs) are involved in hurricane preparedness and response in the days leading up to landfall, during landfall and post storm. Helton discussed mission assignments (MAs) that SSCs typically respond to including oil spills, displaced vessels, chemical spills, and hazardous debris.

Virtual and In-Person Incident Command Lessons Learned

Panelists from different federal and state agencies discussed the lessons learned from setting up virtual and in-person command posts. LCDR Erica Brewton (USCG) opened the panel by discussing lessons learned from setting up incident command in Sector Mobile, which encountered seven named storms. In addition to using partner support, Brewton noted best practices from the 2020 hurricane season including identifying roles that could not be done virtually, using technology (e.g.,

video chat) for communicating, and deploying drones for post-storm monitoring. Brewton also described areas for improvement such as making USCG platforms more cohesive to other agency platforms, identifying the correct tools needed prior to a storm, and securing safe lodging for staff so they are not commuting during a storm.

Jonathan Gordon (ONMS) elaborated on the successes and shortfalls of various virtual platforms used by NOAA and other state and federal partners, focusing on video conferencing and internal tools for incident management. Gordon described that employees will need to request access to most platforms (other than Google), starting with the office IT manager. There is no "one size fits all" government-wide tool for incident management, but the Google Suite is often used for collaboration within NOAA.

Kate Wheelock (OR&R) focused on the best practices used by the NOS's Incident Management Team (IMT) that were not affected by the pandemic such as conducting meetings remotely and providing information into the NOS Disaster Coordination Dashboard (DCD) which then generates incident reports for leadership. Wheelock described some of the lessons learned by the IMT including examining COOP across NOAA to evaluate the need for physical locations and infrastructure and to enhance utilities for remote work locations.

Mel Gaspard (LA GOHSEP) described virtual operations during the pandemic, such as conducting virtual meetings, using electronic dashboards, and setting up radio communication in case of power outages. For the 2021 hurricane season, Gaspard anticipates a semi-virtual environment since the pandemic is still a threat to staff safety.

James Russo (FEMA) described the stress factors put onto staff from a record-breaking hurricane and fire season, in addition to the White House making all states eligible for FEMA funding during the pandemic. Russo described that some programs were adapted to become virtual and additional mitigation measures were put in place to protect those in the field including: daily briefs, use of technology (i.e., drones) when possible, and identifying safe, isolated lodging for staff in the field.

Looking Ahead to 2021 Hurricane Season

Outgoing director, CAPT Anne Lynch (HSPO) described the background of this NOAA office, its responsibilities, and available tools such as the Environmental Response Management Application (ERMA). Lynch noted that preparation is key to a successful hurricane season, in addition to a positive attitude, partner support, coordination, and maintaining relationships. Lynch then introduced the new HSPO director, CDR Chris Sloan.

VII. Summit Findings and Recommendations

The following findings were identified during the summit. The Steering Committee identified related recommendations for future consideration to improve NOAA's hurricane preparedness and response capabilities.

1. There is a need to improve ESF 3/10 response coordination, consistency, and implementation.
    a. **Recommendation**: Continue coordination efforts between federal and state entities to improve and refine ESF 3/10 preparedness, response, and post-incident assessments.
    b. **Recommendation**: Identify routine local, regional, and national initiatives to support ESF 3/10 responses through the NRT, Regional Response Teams (RRTs), and other agency and partner initiatives.

2. NOAA and partner facilities may not be resilient to storm impacts, specifically from hurricanes. The loss of essential utilities (i.e., power, water) at NOAA or partner facilities impacts their ability to respond to ESFs and other response and recovery activities during a hurricane.
    a. **Recommendation:** Evaluate the storm resiliency of NOAA facilities and identify potential points of failure of interconnected infrastructure.
    b. **Recommendation:** Improve training and usage of communications systems (i.e., Emergency Notification System (ENS)) with NOAA staff that could be impacted by the loss of utilities during hurricanes.
    c. **Recommendation:** Develop mechanisms to improve the resilience of NOAA and partner facilities to hurricane impacts using existing or new funding sources.
    d. **Recommendation:** Collect information on the functional recovery times (the restoration of the system's services as needed to allow users to resume most of their pre-hurricane activities) of NOAA and partner infrastructure systems to develop strategies that would improve infrastructure resilience and the interdependent capacity of coastal communities to recover from hurricane hazards.

3. Staff health, fatigue, and burnout are ongoing concerns for the hurricane preparedness and response community.
    a. **Recommendation:** Develop a range of options that NOAA programs or line offices could implement to address targeted staff physical or mental health challenges.
    b. **Recommendation:** Promote and offer NOAA employees a range of professional trainings recommended by NOAA Behavioral Health and Wellness to improve stress and fatigue management.

4. As the workforce transitions between telework and on-site workspaces, challenges in telework policy, communication, and resources remain unresolved. There were additional logistical and communication challenges due to difficulties collaborating with NOAA partners on various virtual platforms (e.g., Zoom, Google Meet, Microsoft TEAMS).
    a. **Recommendation:** Identify virtual operation best practices from NOAA line offices to develop, refine, and maintain a hybrid virtual/telework policy that is highly adaptable to meet mission and personnel priorities.

   b. **Recommendation:** Develop a suite of virtual tools that all internal NOAA and external partners can rely on for efficient and effective communication.

5. Many NOAA line offices have their own internal situational awareness boards, but there is no combined board to ensure broad agency-wide awareness during a collaborative response, such as a hurricane.
   a. **Recommendation:** Develop a situational awareness board that includes all impacted NOAA line offices impacted during an event.

VIII. Appendices

A. Summit Agenda

B. Summit Presentations

C. Pre-Summit Survey Technical Report

APPENDIX A
Summit Agenda

NOS Hurricane Preparedness Summit Agenda

June 21, 2021 (Day 1)

1:00 – 5:00 pm (ET)

1:00 **Opening, Overview and Logistics**
Nancy Kinner, Coastal Response Research Center (CRRC)

1:05 **Welcome**
Paul Scholz, Acting Deputy Assistant Administrator, NOAA National Ocean Service (NOS)
Scott Lundgren, Director, NOAA Office of Response and Restoration (OR&R)

1:15 **Summit Objectives and Context**
Charlie Henry, NOAA OR&R

1:25 **Setting the Stage**
Cody Fritz, NOAA National Weather Service (NWS) National Hurricane Center (NHC)
CAPT Christian Rathke, Director, Office of Health Services

1:55 **Q&A Participant Discussion**

2:05 *BREAK*

2:10 **Preparedness & Response Lessons Learned**
Chip Kasper, Meteorologist in Charge, NOAA NWS Key West, FL
CDR Matthew Jaskoski, NOAA Marine Operations Center Atlantic (MAC-A)
CDR Chris Sloan, NOAA OMAO Aircraft Operations Center (AOC)
Keith Laakkonen, National Estuarine Research Reserve System (NERRS)
Savannah Turner, NOAA OR&R

3:10 *BREAK*

3:15 **Preparedness & Response Lessons Learned**
Lauren Nash, Warning Coordination Meteorologist, NWS Slidell/ New Orleans, LA
Geno Olmi, NOAA Southeast and Caribbean Regional Team (SECART)
Melissa Woehle, Florida Department of Environmental Protection
Mike Aslaksen, NOAA National Geodetic Survey (NGS)

4:15 **Emergency Support Function (ESF) 3/10 and NOAA/FEMA Perspective**
Brad Benggio, NOAA OR&R
Adam Davis, NOAA OR&R
Jason Rolfe, NOAA OR&R
Steve Goldstein, NOAA Liaison to FEMA Headquarters

4:45 **Wrap Up and Path Forward**
Kate Wheelock, NOAA OR&R

5:00 *ADJOURN*

Coastal Response Research Center

This event is made possible through the partnership with NOAA's Office of Response and Restoration (OR&R), Disaster Preparedness Program (DPP) in cooperation with the Coastal Response Research Center.

NOAA

June 23, 2021 (Day 2)

1:00 – 5:00 pm (ET)

1:00 **Opening, Overview and Logistics**
Nancy Kinner, Coastal Response Research Center (CRRC)

1:05 **Managing Pandemic Fatigue**
Moderator: *Savannah Turner, NOAA OR&R*
Randy Ashmore, Gallagher Marine
LCDR Kasey Arguelles, U.S. Coast Guard (USCG)
CDR KJ Green, Director Behavioral Health and Wellness, U.S. Public Health Service (USPHS)

1:50 **Q&A Participant Discussion**

2:00 **Case Studies: Unreliability or Loss of Utilities and COOP**
Jace Tunnell, University of Texas at Austin Marine Science Institute (UTMSI) Amos Rehabilitation Keep (ARK)
Jeffry Evans, Meteorologist in Charge, NWS Houston/Galveston, TX

2:20 *BREAK*

2:25 **Coordinating Deployment Logistics**
LCDR Megan Guberski, NOAA Navigation Response Team (NRT)
Paul Fanelli, NOAA Center of Operational Oceanographic Products and Services (CO-OPS)
Doug Helton, NOAA OR&R

2:55 **Q&A Participant Discussion**

3:05 **Virtual and In-Person Incident Command Lessons Learned**
LCDR Erica Brewton, USCG Sector Mobile, AL
Jonathan Gordon, NOAA Office of National Marine Sanctuaries (ONMS)
Kate Wheelock, NOAA OR&R
Melton "Mel" Gaspard, Louisiana's Governor's Office of Homeland Security and Emergency Preparedness
Chief James "Nick" Russo, Senior Type-1 Supervisor Field Leader Cadre, FEMA

3:55 **Q&A Participant Discussion**

4:15 **Looking Ahead to 2021 Hurricane Season**
CAPT Anne Lynch, NOAA Homeland Security Program Office (HSPO)

4:45 **Wrap Up and Path Forward**
Charlie Henry, NOAA OR&R

5:00 *ADJOURN*

For more information: https://crrc.unh.edu/nos-hurricane-summit-2021

This event is made possible through the partnership with NOAA's Office of Response and Restoration (OR&R), Disaster Preparedness Program (DPP) in cooperation with the Coastal Response Research Center.

APPENDIX B
Summit Presentations

2021 NOS Hurricane Preparedness Summit

Nancy E. Kinner, Facilitator
Coastal Response Research Center (CRRC)
University of New Hampshire

June 21, 2021

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HOW TO PARTICIPATE

- **Attendees:** Muted & camera off
- **Panelists:** Unmute & turn on camera ONLY when speaking
- **Interactive Polls:** Exit full screen mode to view polls
- Download GoToWebinar application vs online browser

- **If you have any access issues, please contact Kathy at kathy.mandsager@unh.edu or cell 603.498.8010**

2

Q&A Tool

- **Type questions as you think of them**
  - No need to wait until the Q&A session in the agenda
- Located in main tool bar
- Q&A will be monitored and collated
- Questions may be announced or addressed in the Q&A Tool

Coastal Response Research Center 3

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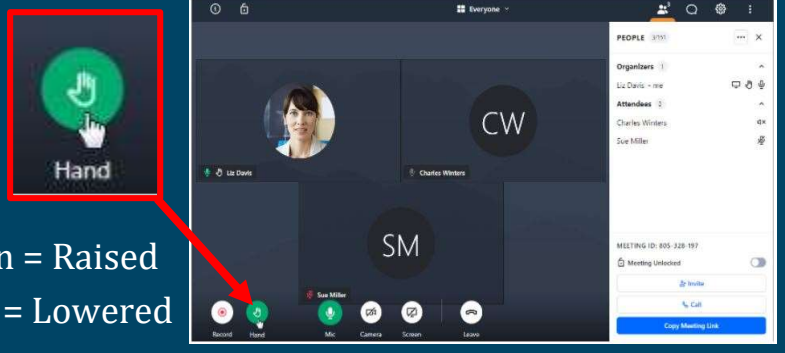
Raise "Hand"



- Green = Raised
- Gray = Lowered

Photos: https://support.goto.com/meeting/help/how-do-i-raise-my-hand-during-a-meeting#:~:text=To%20raise%20your%20hand%2C%20click,by%20you%20or%20the%20organizer.

When invited, unmute and ask your question verbally by using the raise "hand" tool in your tool bar.

Coastal Response Research Center 4

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COASTAL RESPONSE RESEARCH CENTER (CRRC)
Partnership between NOAA's Office of Response and Restoration and the University of New Hampshire
Since 2004
UNH Co-Director – Nancy Kinner
NOAA Co-Director – Troy Baker
Coastal Response Research Center
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Coastal Response Research Center (NOAA $)
Center for Spills and Environmental Hazards (All Other $)
Conduct and Oversee Basic and Applied Research and Outreach on Spill and Other Environmental Disaster Response and Restoration
Transform Research Results into Practice
Serve as Hub for Spill and Environmental Disaster R&D
Facilitate Interaction Among Spill/Environmental Disaster Community (All Stakeholders)
Educate/Train Students Who will Pursue Careers in Spill Response and Restoration
Coastal Response Research Center
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6

STEERING COMMITTEE

Charlie Henry, NOAA OR&R GoM DRC
Brad Benggio, NOAA OR&R ERD
Matthew Chasse, NOAA OCM
Jeff Cupo, NOAA NWS
LT John Kidd, NOAA NRT
Lisa Symons, NOAA ONMS
Cory Rhodes, NOAA OR&R GoM DRC
LCDR Megan Guberski, NOAA OMAO
Nancy Kinner, UNH CRRC
Katie Perry, UNH CRRC

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THANK YOU FOR LISTENING

https://crrc.unh.edu/nos-hurricane-summit-2021

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Paul M. Scholz

Acting Deputy Assistant Administrator for Ocean Services and Coastal Zone Management

National Ocean Service,
National Oceanic and Atmospheric Administration

National Ocean Service

9

Scott Lundgren

Director

NOAA NOS Office of Response and Restoration (OR&R)

June 21, 2021

National Ocean Service

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2021 NOAA Hurricane Preparedness Summit:

Putting NOAA in a Better Posture to Respond to the 2021 Hurricane Season

SUMMIT OBJECTIVES AND CONTEXT

Charlie Henry

Director, NOAA's Gulf of Mexico Disaster Response Center

NOAA/NOS/OR&R/Disaster Preparedness Program

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2021 NOAA Hurricane Preparedness Summit:

Putting NOAA in a Better Posture to Respond to the 2021 Hurricane Season

- Thank you!
- 2nd Summit (we plan to make this an annual preparedness activity)
- Origin
- The 2021 Summit:
  - Objectives:
    - Understand best practices and lessons learned from 2020 hurricane season;
    - Personnel (People), Mission, and Infrastructure (PMI) focus;
    - improve consistency in response between federal and state partners;
    - recognize challenges for next hurricane season (Pre-Summit Survey);
    - better understand readiness and response gaps given identified limitations (applies both internal to NOAA and with our close partners).

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2021 NOAA Hurricane Preparedness Summit:

Putting NOAA in a Better Posture to Respond to the 2021 Hurricane Season

- The 2021 Summit (continued):
  - 32 Presenters and Panel Members (not counting Nancy Kinner and myself)
    - Four Federal Agencies
    - State Partners from TX, LA, and FL
    - Industry
  - Steering Committee:
    - Lisa Symons (NOS/ONMS), Brad Benggio (NOS/ORR), LT John Kidd (NOS/OCS), Matt Chasse (NOS/OCM), Jeff Cupo (NWS), Cory Rhodes (NOS/ORR), Katie Perry (UNH/CRRC), Nancy Kinner (UNH/CRRC), and Charlie Henry (ORR).

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2021 NOAA Hurricane Preparedness Summit Pre-Summit Survey (April 2021)

- Conducted by University of New Hampshire Survey Center (Thank you!)
- Summary - looking ahead to the 2021 Hurricane Season, a majority of respondents consider the following as significant challenges:
  - **managing the multiple aspects of pandemic related fatigue,**
  - **complacency of others to follow COVID-19 safety guidelines, and**
  - **unreliability or loss of utilities.**
  - These responses were key insights that helped the Steering Committee develop the 2021 agenda along with other survey identified expected challenges…

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Pre-Summit Survey (April 2021) Cont.

- Common themes in 2020 and 2021 were:
  - How to keep their people safe and maintain access to adequate protection during response activities and for staff evacuations;
  - having enough qualified personnel to respond, and
  - continuity of operations planning.

One difference between 2020 and 2021 – in 2021, many more believe that the have found workable best management practices to mitigate many of these potential mission impacts and safety concerns.

"We've lived through a lot and have learned a lot since March 2020."

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2021 NOAA Hurricane Preparedness Summit Pre-Summit Survey (April 2021)

Figure 1a: What is the name of your organization/agency? (Coded)

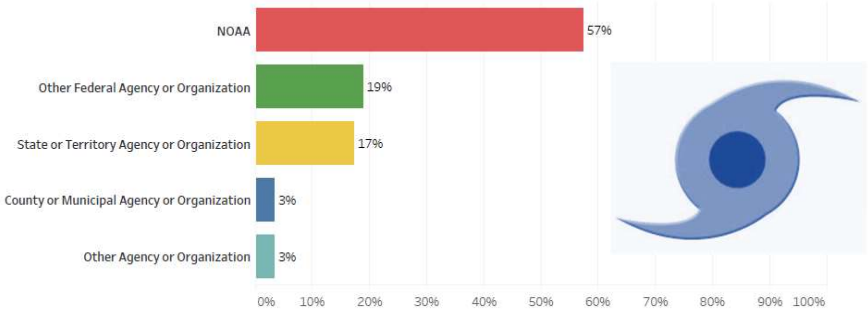

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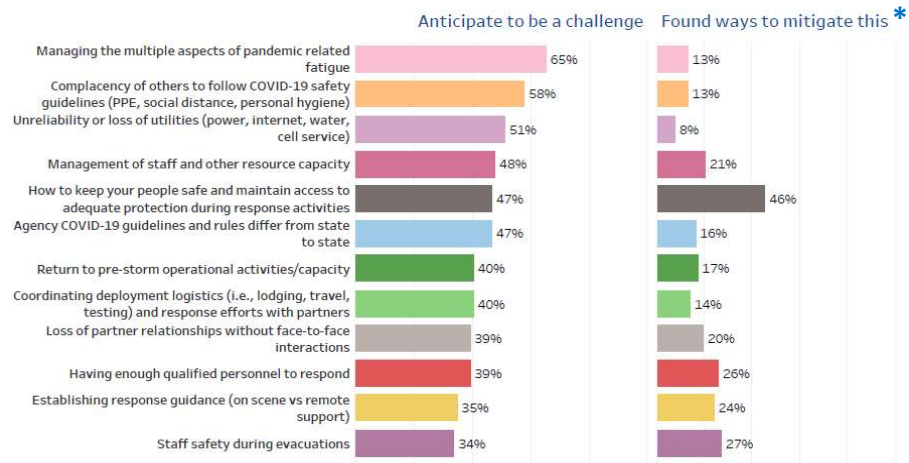
Figure 11a: Which of the following do you anticipate as challenges for the 2021 hurricane season? (Select all that apply)



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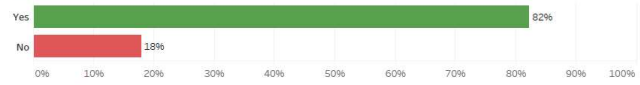
2021 NOAA Hurricane Preparedness Summit Pre-Summit Survey (April 2021)

Hurricane Preparedness & Response

Just over four in five respondents (82%) say their agency or organization has a hurricane preparedness or response plan while 18% do not.

Figure 4a: Does your organization/agency have a hurricane preparedness/response plan?



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HURRICANE PREPAREDNESS

A look back at 2020 and what to expect in 2021…

Cody Fritz
National Hurricane Center
Storm Surge Unit
June 21, 2021

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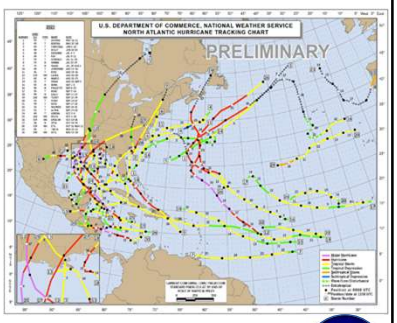
Seasonal Overview

- Record-breaking season (30 named storms), 10 of which required storm surge watches and warnings
- 639 advisories issued (average season is 322)
- 11 U.S. landfalls
  - 6 hurricanes (Hanna, Isaias, Laura, Sally, Delta, Zeta)
- 8 Gulf Coast landfalls
  - Cristobal, Hanna, Laura, Sally, Beta, Delta, Zeta, Eta
- 13 International landfalls
  - Two Category 4 landfalls in Nicaragua 2 weeks and 15 miles apart (Eta, Iota)
  - Subtropical storm landfall in Portugal (Alpha)
  - Direct impacts in nearly every country in the Atlantic basin



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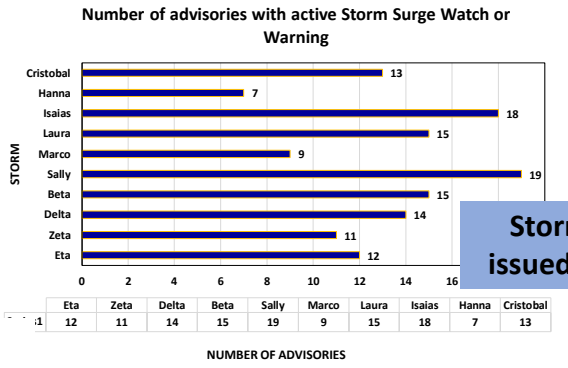
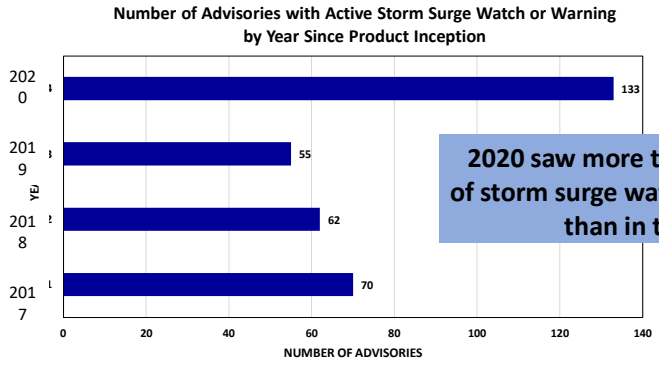
Seasonal Overview



Storm Surge Watch/Warning issued for 133 Total Advisories

21

Seasonal Overview



2020 saw more than twice the number of storm surge watches/warnings issued than in the previous two years

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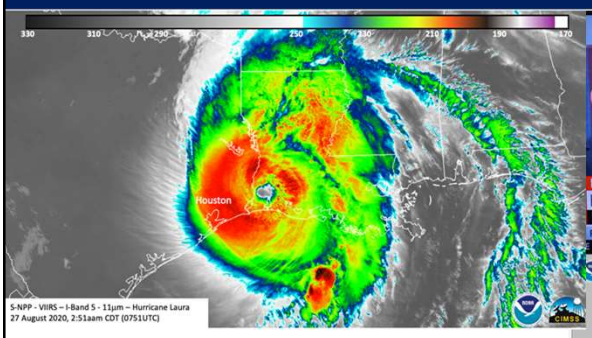
Seasonal Overview



HURRICANE LAURA

hurricanes.gov/ @NHC_Atlantic hurricanes.gov/surge @NHC_Surge

23

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Seasonal Overview: Hurricane Laura

hurricanes.gov/ @NHC_Atlantic hurricanes.gov/surge @NHC_Surge

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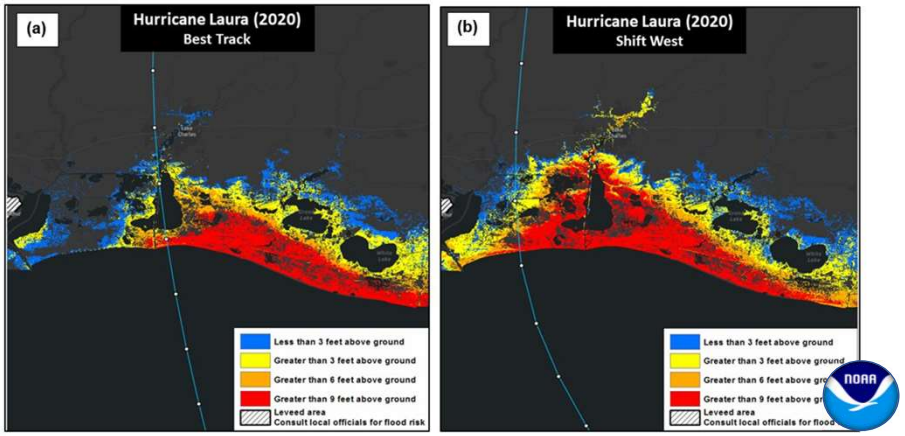
What about Lake Charles?



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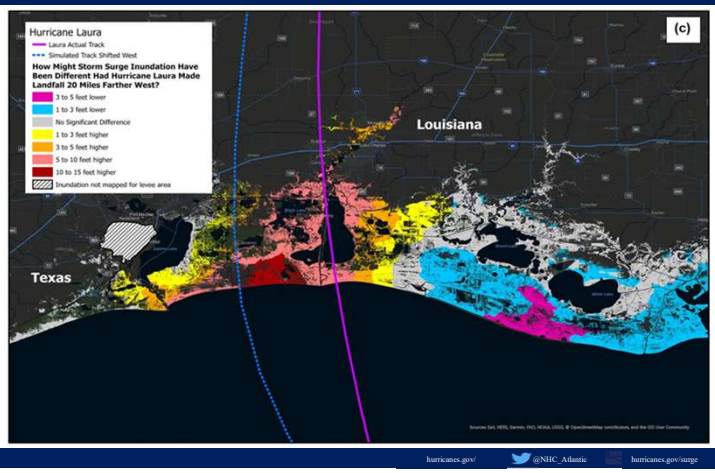

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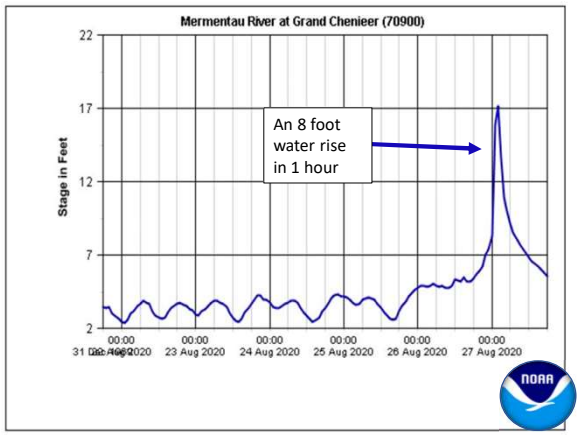
But Was it Unsurvivable?



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But Was it Unsurvivable?

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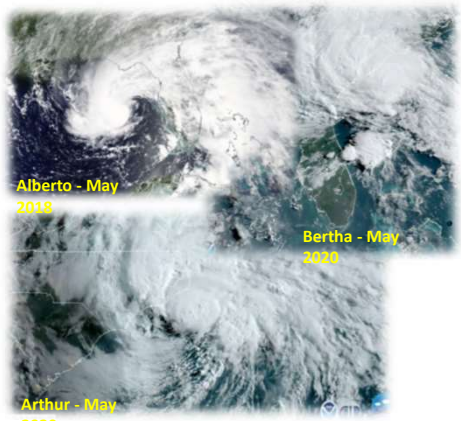
New in 2021
Atlantic Tropical Weather Outlooks Began May 15



In 2021, NHC began issuing Tropical Weather Outlooks on **May 15**

- No change to the official start of hurricane season
- Will provide information on possible development prior to June 1

Now 7 straight years with at least one named storm prior to June 1st

- In 2020, 36 special TWOs issued prior to June 1
- 5 of the recent pre-season storms have impacted the United States

hurricanes.gov/ @NHC_Atlantic hurricanes.gov/surge @NHC_Surge

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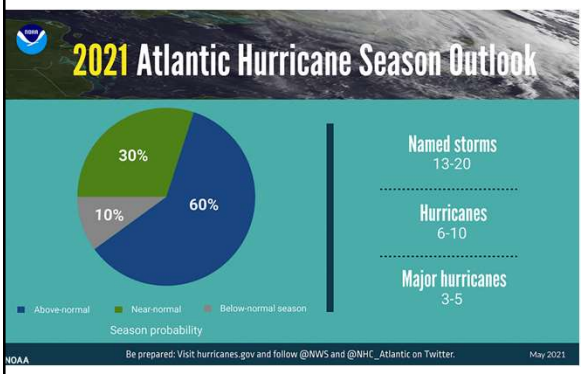
2021 Atlantic Hurricane Season Outlook



Factors in the seasonal outlook:

ENSO conditions are currently neutral, with the possibility of La Nina returning later in the season

Sea-surface temperatures over the tropical Atlantic Ocean and Caribbean Sea are expected to be warmer than average

Tropical Atlantic trade winds expected to be weaker than normal

Enhanced west African monsoon

hurricanes.gov/ @NHC_Atlantic hurricanes.gov/surge @NHC_Surge

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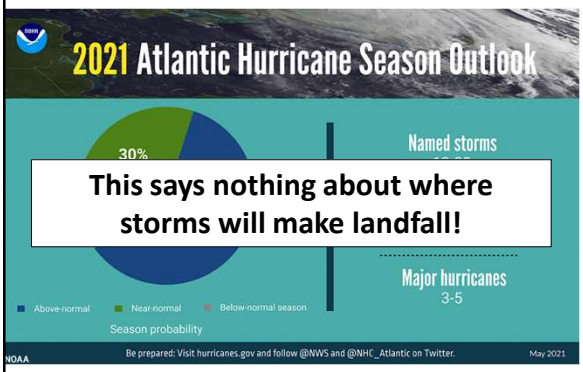
2021 Atlantic Hurricane Season Outlook



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Tropical Atlantic trade winds expected to be weaker than normal

Enhanced west African monsoon

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2021 Change
World Meteorological Organization Tropical Cyclone Naming Update

Retired Tropical Cyclone Names

- Four hurricane names were retired from the 2019-2020 seasons
  - Dorian replaced with Dexter (2025)
  - Laura replaced with Leah (2026)

Supplemental List of Atlantic Tropical Cyclone Season

Adria	Heath	Orlanda
Braylen	Isla	Pax
Caridad	Jacobus	Ronin
Deshawn	Kenzie	Sophie
Emery	Lucio	Tayshaun
Foster	Makayla	Viviana
Gemma	Nolan	Will

- Overflow name list no longer includes the Greek Alphabet
- Supplemental name lists for Atlantic and Eastern Pacific basins

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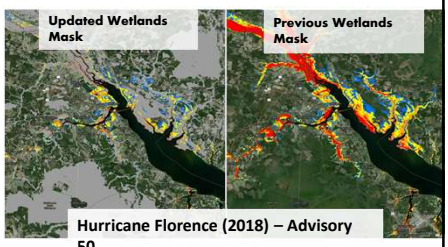
New in 2021
A New Version of P-Surge

- Probabilistic Storm Surge (P-Surge) was upgraded in May (2021) to provide better overall storm surge guidance via improvements in forecast predictability and consistency.
- Expanded wetlands mask in Potential Storm Surge Flooding Graphic (tidal and non-tidal wetlands)
- Year 2 of experimental Peak storm surge flooding graphic



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HURRICANE PREPAREDNESS

Feedback/Questions?

Cody.Fritz@noaa.gov

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Pandemic Updates & Predictions
MAY 2021
Department of Commerce 2021 Hurricane Conference
1

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CHRISTIAN RATHKE
Captain/ USPHS
NOAA Director, Office of Health Services
- Aviation Medicine
- Behavioral Health
- Dive Medicine
- Marine Medicine
- NOAA Corps Medical Affairs
Department of Commerce 2021 Hurricane Conference
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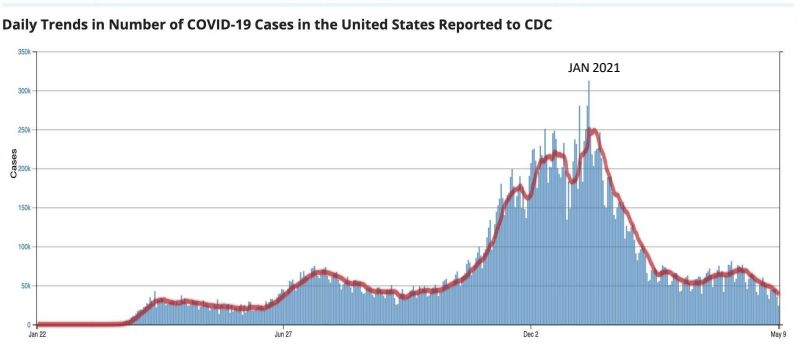
Daily COVID Cases JAN2020-MAY2021



Department of Commerce 2021 *Hurricane Conference*

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Pandemic Perspective

- Whitehouse COVID Task Force
- Congressional Initiatives
- CDC/ NIH/ Global Scientific Community
- DOC/ NOAA/ Individual Programs

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How is COVID-19 Spread?

- Viral Load
- Colonization
- **Viral Particles**
- **Viral Dose**

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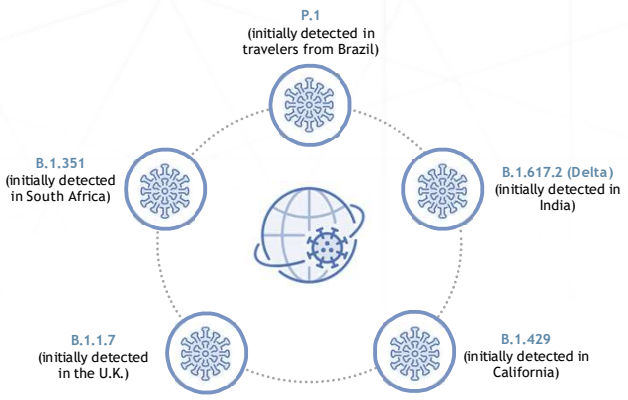
What are COVID-19 Variants?

A US government interagency group developed a Variant Classification scheme that defines three classes of SARS-CoV-2 variants:

Variant of Interest (VOI)
Variant of Concern (VOC)
Variant of High Consequence

There are currently six VOCs in the United States.



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FEHBP Participant Claims JAN - AUG 2020 Compared to 2019

Federal Employees Health Benefit Program (FEHBP) members' utilization of preventive care services has significantly decreased during the COVID-19 pandemic.

- Annual Wellness Visits fell **18.6%**
- Colonoscopies fell **32.2%**
- Mammograms fell **23.8%**
- Pediatric Immunizations fell **16.2%**
- Prostate Exams fell **16.8%**
- Women's Preventive Exams fell **36.2%**

https://www.fedweek.com/issue-briefs/deferred-preventive-care-raising-health-risks-to-fehb-enrollees-says-report/

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Burnout

Workplace Stress Dimensions

- job status uncertainty
- a change in workplace expectations
- work overload
- stress from the work-home interface
- relationships at work
- leading activities
- dealing with patients or customers

Six Key Domains of Burnout

Workload
Control
Reward
Community
Fairness
Values

Burnout Characteristics:

Physical fatigue
Cognitive weariness
Emotional exhaustion

Burnout Feelings:

Being helpless
Hopeless
Cynical
Resentful

Gonçalves A, Fontes L, Simães C, Gomes AR. Stress and burnout in health professionals. In: Arezes PM, Baptista JS, Barroso MP, et al, eds. Occupational and environmental safety and health.

Maslach C, Leiter MP. Understanding the burnout experience: Recent research and its implications for psychiatry. World psychiatry 2016

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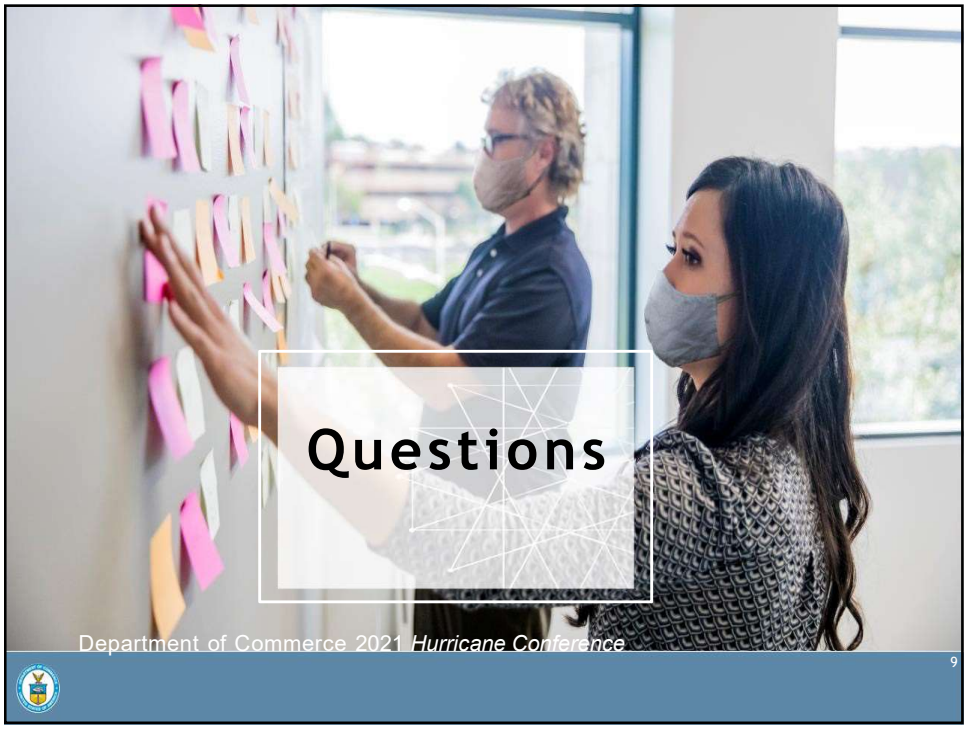
Questions
Department of Commerce 2021 Hurricane Conference
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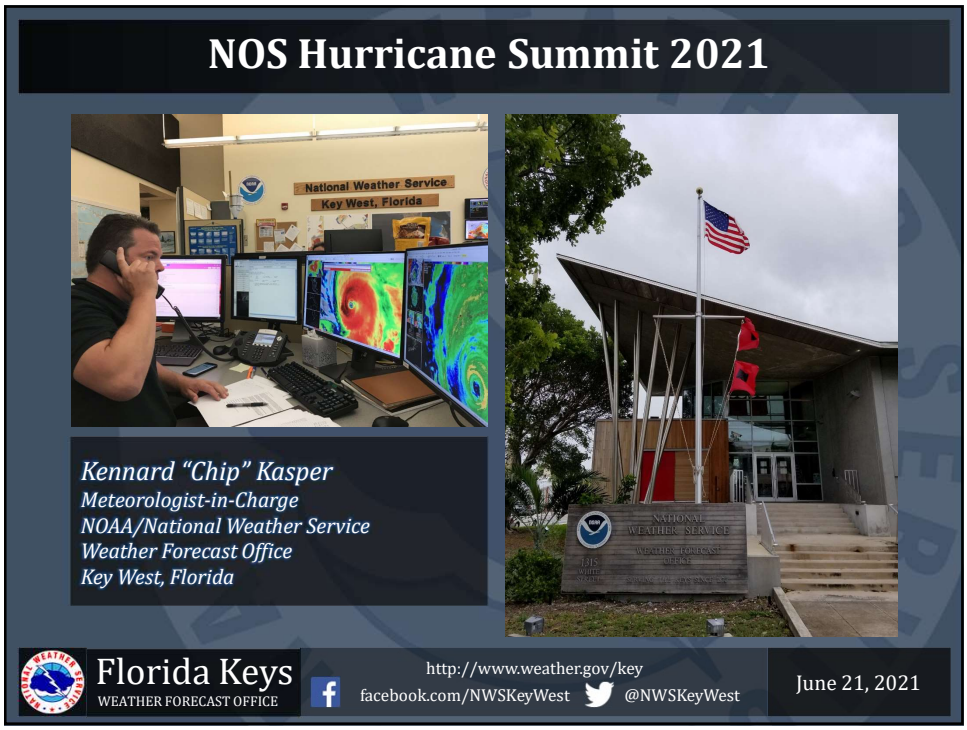
NOS Hurricane Summit 2021
National Weather Service
Key West, Florida
Kennard "Chip" Kasper
Meteorologist-in-Charge
NOAA/National Weather Service
Weather Forecast Office
Key West, Florida
Florida Keys
WEATHER FORECAST OFFICE
http://www.weather.gov/key
facebook.com/NWSKeyWest
@NWSKeyWest
June 21, 2021

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"Preparedness & Response" in context of NWS WFO

- *We are NOT a "9-to-5 agency".*
- *We operate 24/7/365 serving Florida Keys communities.*
- *Emergency/Essential Federal employees supporting federal, state, and municipal emergency managers, first responders, and other public safety officials before, during, and after a hurricane/disaster.*

Florida Keys WEATHER FORECAST OFFICE
http://www.weather.gov/key
facebook.com/NWSKeyWest @NWSKeyWest
June 21, 2021

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Preparedness and Response

Priorities:

- *Health and Safety of our Team*
- *Mission of Protecting Life & Property*

✓ *Minimize Risk (Risk Reduction)*

Florida Keys WEATHER FORECAST OFFICE
http://www.weather.gov/key
facebook.com/NWSKeyWest @NWSKeyWest
June 21, 2021

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Preparedness and Response

Key West Weather Forecast Office (KEY) Staffing and Infrastructure Plan for COVID-19

May 29, 2020

Prepared by:
Kennard "Chip" Kasper, WFO Key West Meteorologist-In-Charge
Chris Jacobson, WFO Key West NWSEO Steward

KEY COVID-19 Plan Version 1.0

- *Followed all DOC/NOAA/NWS public health guidance (informed by USPHS).*
- *Posted signs.*
- *Moved computer workstations (at least 15 feet apart).*
- *Developed alternative "Shelter-in-Place" plan should the need arise due to expected major hurricane impact.*
- *Made use of some telework.*

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Preparedness and Response

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Preparedness and Response

TELEWORKING =
RADICAL CULTURE CHANGE AT A NWS WFO

March 12, 2020: We do not, and never have teleworked.
March 13, 2020: We may telework under certain circumstances.
March 21, 2020: Everyone not working an operational shift must telework

Florida Keys
WEATHER FORECAST OFFICE
http://www.weather.gov/key
facebook.com/NWSKeyWest @NWSKeyWest
June 21, 2021

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Teleworking – NOT the same for everyone!

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Preparedness and Response

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June 21, 2021

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Preparedness and Response

We successfully cope with the hurricane threat by…

(1) Staying Aware.
(2) Being Prepared.
(3) Working Together.

be… HURRICANE PREPARED

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http://www.weather.gov/key
facebook.com/NWSKeyWest @NWSKeyWest
June 21, 2021

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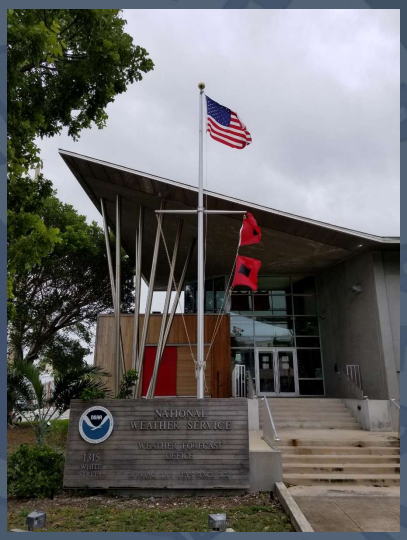
NOS Hurricane Summit 2021



Kennard "Chip" Kasper
kennard.kasper@noaa.gov
305-304-6712

Florida Keys
WEATHER FORECAST OFFICE

http://www.weather.gov/key
facebook.com/NWSKeyWest @NWSKeyWest

June 21, 2021

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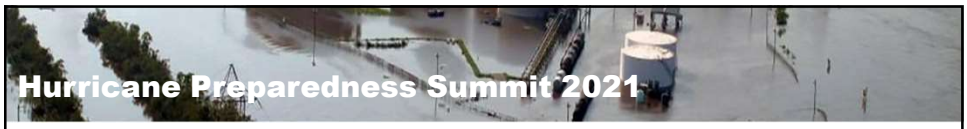

Marine Operations (MO)

Commander Matthew Jaskoski, NOAA
Executive Officer, Marine Operations Center Atlantic
NOAA Marine Operations
21 JUNE 2021

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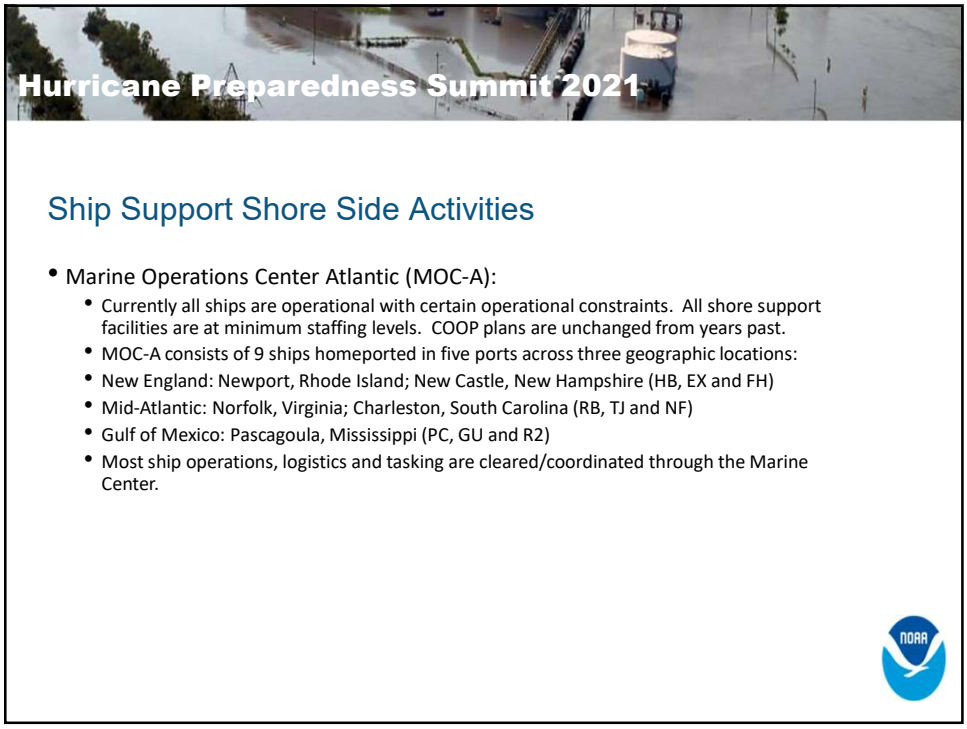
Hurricane Preparedness Summit 2021
Ship Support Shore Side Activities
• Marine Operations Center Atlantic (MOC-A):
• Currently all ships are operational with certain operational constraints. All shore support facilities are at minimum staffing levels. COOP plans are unchanged from years past.
• MOC-A consists of 9 ships homeported in five ports across three geographic locations:
• New England: Newport, Rhode Island; New Castle, New Hampshire (HB, EX and FH)
• Mid-Atlantic: Norfolk, Virginia; Charleston, South Carolina (RB, TJ and NF)
• Gulf of Mexico: Pascagoula, Mississippi (PC, GU and R2)
• Most ship operations, logistics and tasking are cleared/coordinated through the Marine Center.

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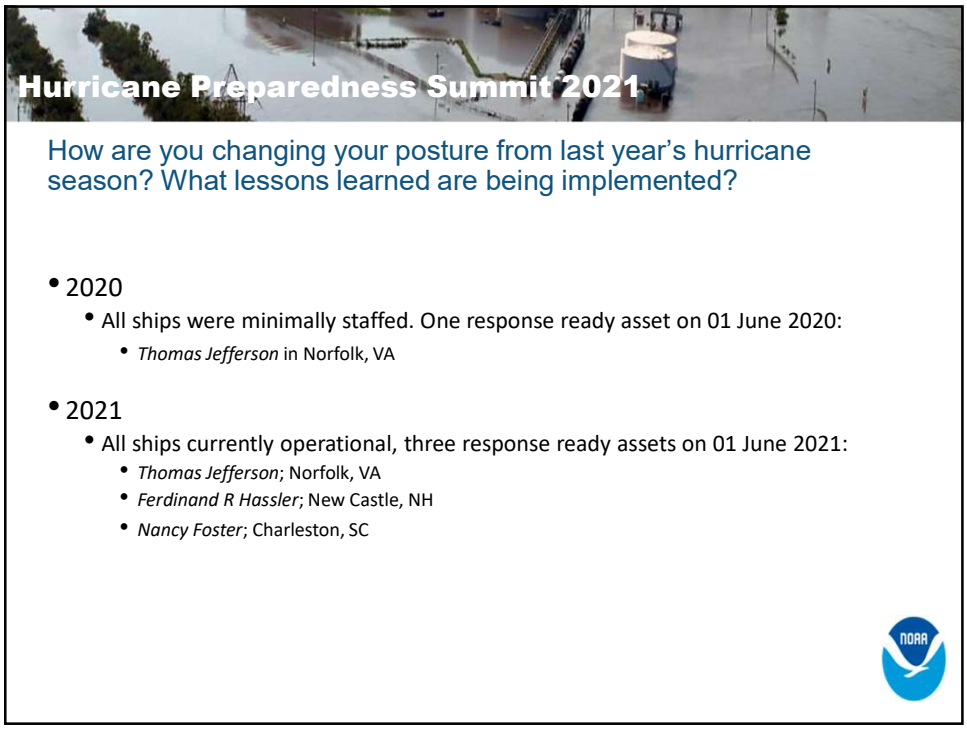
Hurricane Preparedness Summit 2021
How are you changing your posture from last year's hurricane season? What lessons learned are being implemented?
• 2020
• All ships were minimally staffed. One response ready asset on 01 June 2020:
• *Thomas Jefferson* in Norfolk, VA
• 2021
• All ships currently operational, three response ready assets on 01 June 2021:
• *Thomas Jefferson*; Norfolk, VA
• *Ferdinand R Hassler*; New Castle, NH
• *Nancy Foster*; Charleston, SC

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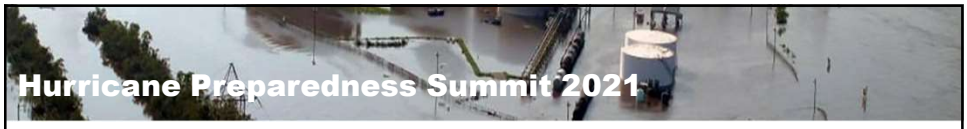

Hydrographic Survey Response Capabilities

- Nancy Foster (NF): GoM, Caribbean and Atlantic Coast
  - Shallow water multibeam echosounder (SWMB).
  - Best utilized for offshore approaches to an impacted port.
  - Medium endurance, low in-house operational response expertise.
- Ferdinand R. Hassler (FH): Atlantic Coast Southeast and Northeast
  - 2 x Shallow water multibeam echosounders, 1 x Smallboat with SWMB.
  - Best utilized for offshore approaches or limited near-coastal work at an impacted port
  - Low operational endurance, high in-house operational expertise.
- Thomas Jefferson (TJ): Mid-Atlantic Coast, Chesapeake bay
  - Shallow & mid-water multibeam echosounders, and object detection side scan sonars (SSS)
  - Two fully capable survey launches with SWMB and SSS.
  - High endurance, and operational expertise; fully capable of meeting nearly all hydro survey response needs.

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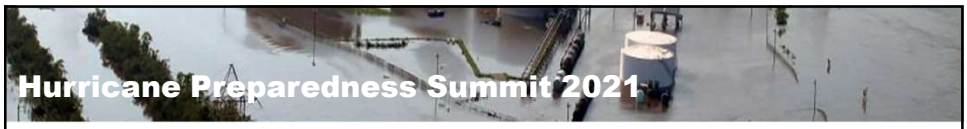
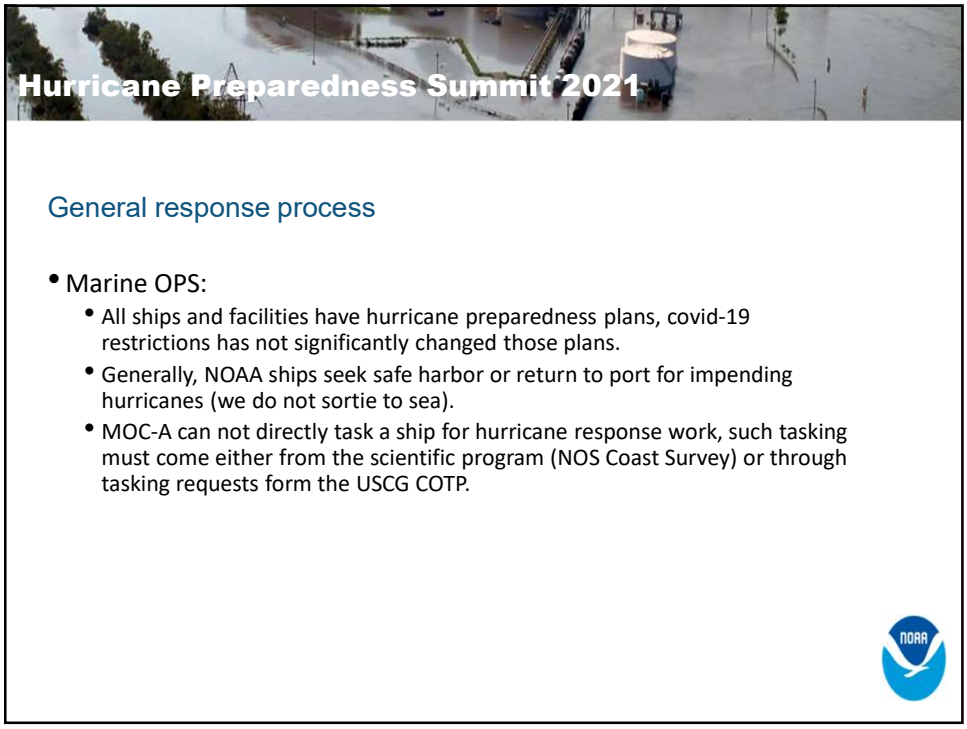


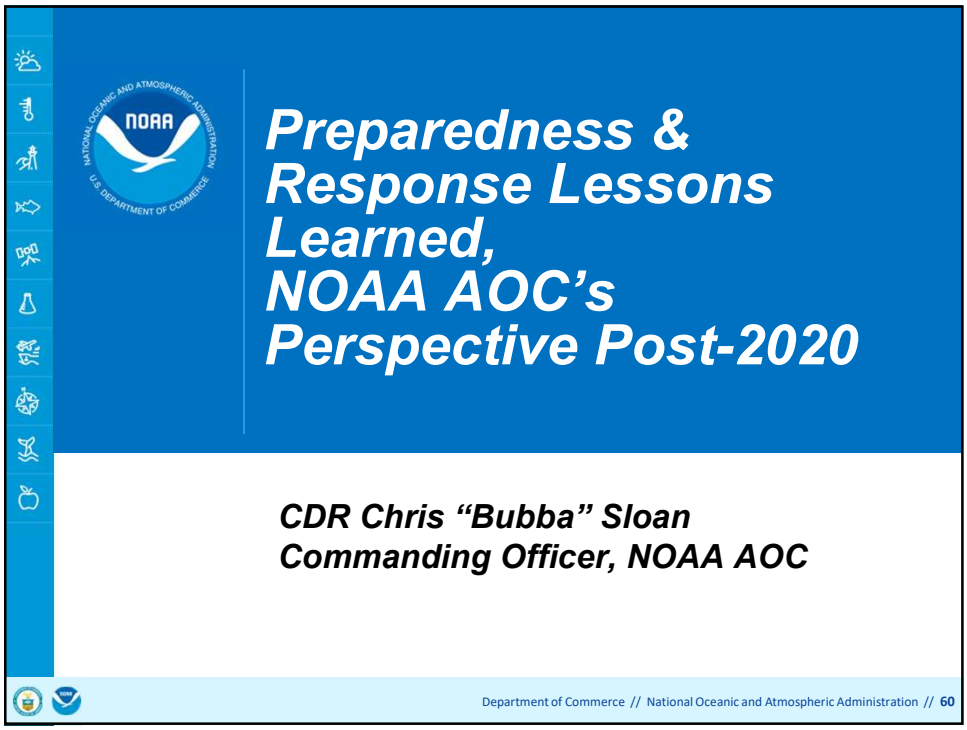
Constraints and Restraints

- Pre-sail criteria:
  - As of 6/11/2021 All personnel embarking on NOAA Ships must shelter-in-place for minimum 7 days, and have two negative COVID Tests prior to embarking. As vaccination rates increase to 100% relaxation of certain protocols *may* follow.
- Open and Closed Bubbles
  - Closed bubble period consist of ~45 days of full operations or operational readiness, limited or no port calls, minimal crew transfers, all crew transfers must SIP prior to embarking.
  - Open bubble periods generally consist of 2-3 weeks alongside for crew rest, minimal contracted & ship's force repairs, fueling/provisioning/etc., and SIP.
  - Currently there is no period where all three response capable ships are in Open Bubble status. However, the highest risk is a hurricane making landfall near the end of a ship's closed bubble period. This could potentially extend the Closed Bubble period leading to increased operational fatigue, and low levels of fuels/stores aboard.

58


Hurricane Preparedness Summit 2021
General response process
• Marine OPS:
• All ships and facilities have hurricane preparedness plans, covid-19 restrictions has not significantly changed those plans.
• Generally, NOAA ships seek safe harbor or return to port for impending hurricanes (we do not sortie to sea).
• MOC-A can not directly task a ship for hurricane response work, such tasking must come either from the scientific program (NOS Coast Survey) or through tasking requests form the USCG COTP.

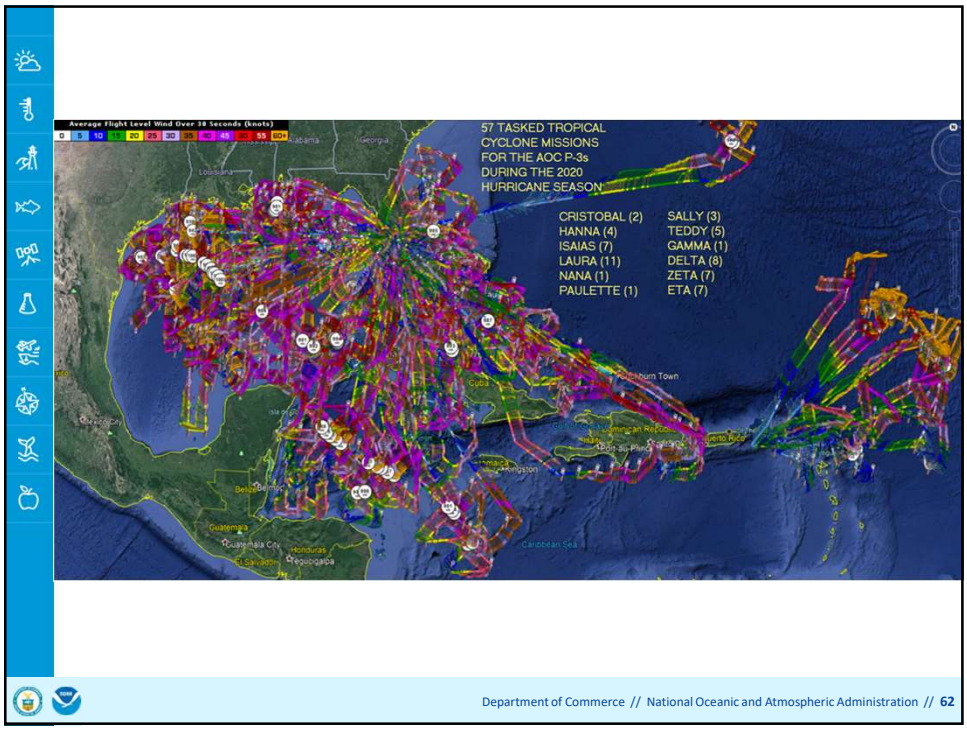
59


Preparedness & Response Lessons Learned, NOAA AOC's Perspective Post-2020
CDR Chris "Bubba" Sloan
Commanding Officer, NOAA AOC
Department of Commerce // National Oceanic and Atmospheric Administration // 60

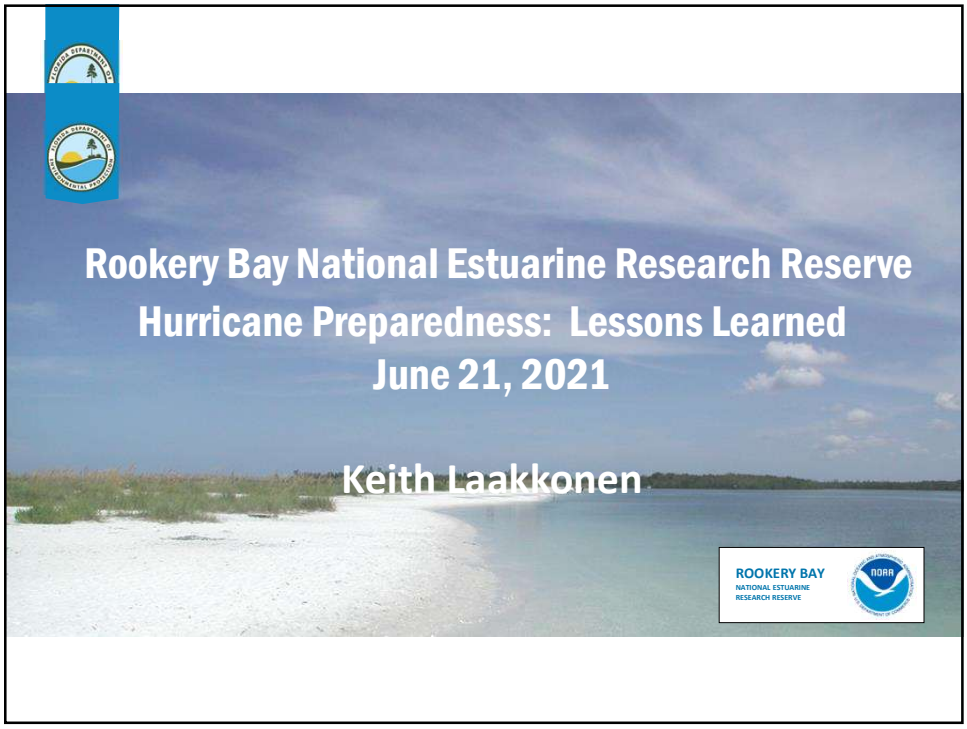
60


2020 Atlantic Hurricane Season
by the numbers
12
Storms hit the U.S. coastline, (5 of which came ashore in Louisiana)
Previous record: 9 in 1916
13
Hurricanes
Average season has six
6
Major hurricanes
Average season has three
10
Named storms that formed in September
Most for any month on record
10
Rapidly intensifying storms sampled
by NOAA and the U.S. Air Force
30
Named storms
Arthur
Bertha
Cristobal
Dolly
Edouard
Fay
Gonzalo
Hanna
Isaias
Josephine
Kyle
Laura
Marco
Nana
Omar
Paulette
Rene
Sally
Teddy
Vicky
Wilfred
Alpha
Beta
Gamma
Delta
Epsilon
Zeta
Eta
Theta
Iota
NOAA Hurricane Hunters
86
Missions conducted
102
Hurricane eyewall passages
678
Flight hours
1,772
Dropsondes deployed
to gather vital atmospheric data
NOAA underwater hurricane gliders
47
Glider deployments
13,272
Gathered observations
179,401
Temperature and salinity profiles
These help improve forecasts for current storms
16
NOAA weather satellites in operation
5th
consecutive above-normal season
Previous record: 4 from 1998 to 2001
86
Facebook Live broadcasts
from the National Hurricane Center
Department of Commerce // National Oceanic and Atmospheric Administration // 61

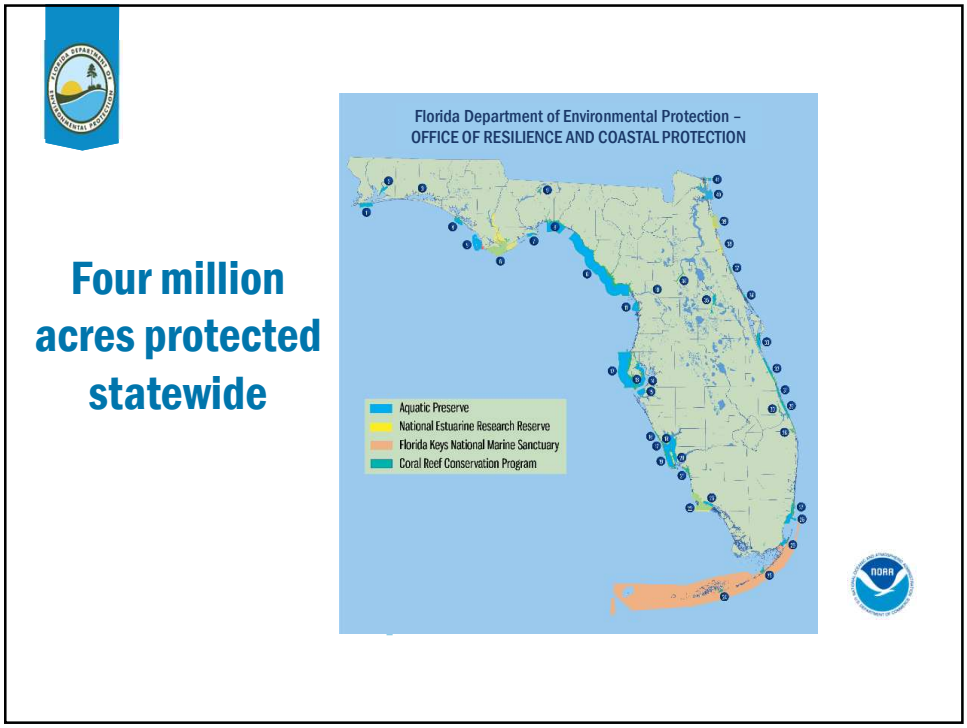
61


Average Flight Level Wind Over 10 Seconds (knots)
57 TASKED TROPICAL CYCLONE MISSIONS FOR THE AOC P-3s DURING THE 2020 HURRICANE SEASON
CRISTOBAL (2)
HANNA (4)
ISAIAS (7)
LAURA (11)
NANA (1)
PAULETTE (1)
SALLY (3)
TEDDY (5)
GAMMA (1)
DELTA (8)
ZETA (7)
ETA (7)
Department of Commerce // National Oceanic and Atmospheric Administration // 62

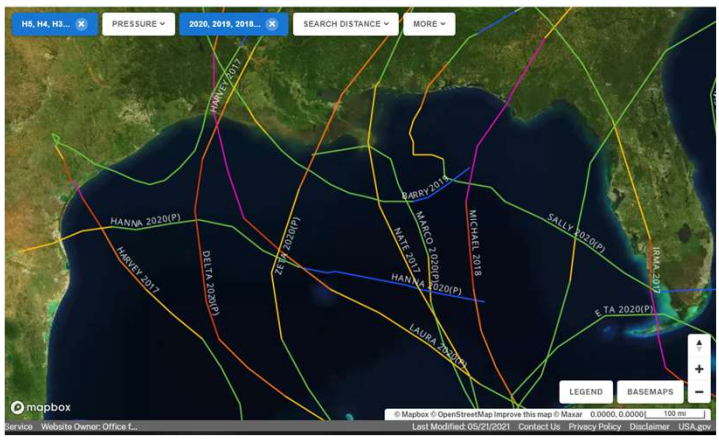
62


Rookery Bay National Estuarine Research Reserve
Hurricane Preparedness: Lessons Learned
June 21, 2021
Keith Laakkonen
ROOKERY BAY
NATIONAL ESTUARINE
RESEARCH RESERVE
NOAA

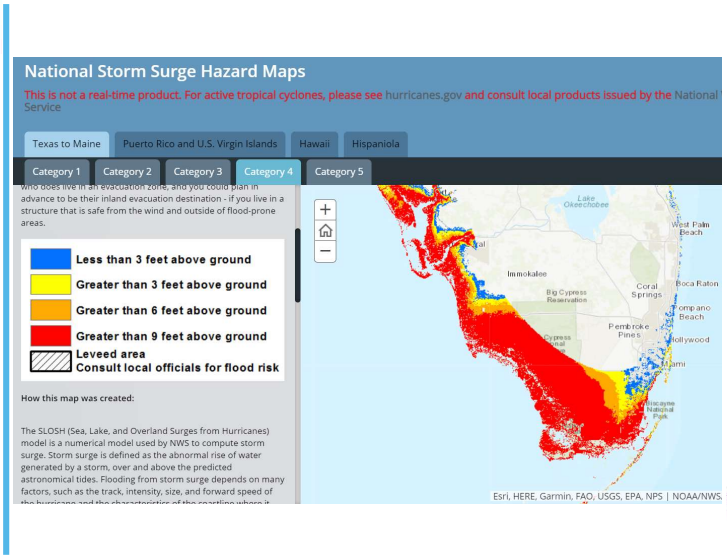
63


Four million acres protected statewide
Florida Department of Environmental Protection –
OFFICE OF RESILIENCE AND COASTAL PROTECTION
Aquatic Preserve
National Estuarine Research Reserve
Florida Keys National Marine Sanctuary
Coral Reef Conservation Program
NOAA

64

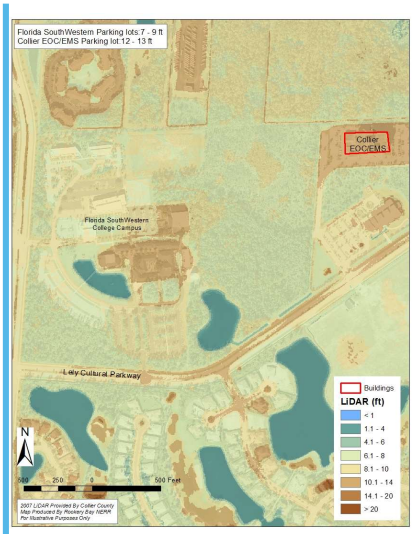

H5, H4, H3...
PRESSURE
2020, 2019, 2018...
SEARCH DISTANCE
MORE
HANNA 2020(P)
HARVEY 2017
DELTA 2020(P)
ZETA 2020(P)
NATE 2017
MARCO 2020(P)
HANNA 2020(P)
BARRY 2019
MICHAEL 2018
SALLY 2020(P)
IRMA 2017
E TA 2020(P)
LAURA 2020(P)
LEGEND
BASEMAPS
mapbox

65


National Storm Surge Hazard Maps
This is not a real-time product. For active tropical cyclones, please see hurricanes.gov and consult local products issued by the National Service
Texas to Maine
Puerto Rico and U.S. Virgin Islands
Hawaii
Hispaniola
Category 1
Category 2
Category 3
Category 4
Category 5
Less than 3 feet above ground
Greater than 3 feet above ground
Greater than 6 feet above ground
Greater than 9 feet above ground
Leveed area
Consult local officials for flood risk
How this map was created:
The SLOSH (Sea, Lake, and Overland Surges from Hurricanes) model is a numerical model used by NWS to compute storm surge. Storm surge is defined as the abnormal rise of water generated by a storm, over and above the predicted astronomical tides. Flooding from storm surge depends on many factors, such as the track, intensity, size, and forward speed of
Esri, HERE, Garmin, FAO, USGS, EPA, NPS | NOAA/NWS

66

Florida Southwestern Campus & Collier EOC

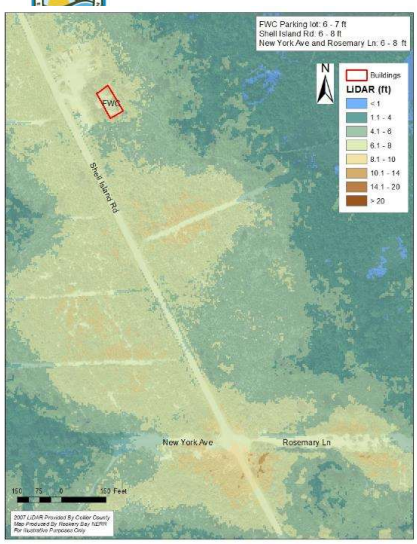


67

68

Rookery Bay NERR

69



70

71

Apalachicola SWMP Station

72

Apalachicola NERR Aquaria

73

Grand Bay NERR Weather Station

74

Mission Aranasas NERR

75

Hurricane Prep with COVID Safety Layer

Reserve Preparation

- PPE and Social Distancing
- Governor, Agency and Local Guidance
  - When to begin preparations - wait until the last minute.
  - Pull boats and leave them out

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National Oceanic and Atmospheric Administration Office of Response and Restoration

Providing A Safe and Ready Command Center for Continuity of Operations and Mission Support – A Health and Safety Perspective

Savannah Turner, Safety Officer
National Oceanic and Atmospheric Administration
Office of Response & Restoration
June 2021

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Gulf of Mexico Disaster Response Center

- September 2020 - USCG Continuity of Operations
- October 2020 - USCG Hurricane Sally Incident Command Post
- Base of operations for approx. 8 weeks
- Defined success by no infection

Image Credit: NOAA

79

Limitations & Constraints

OR&R Scientific Support Coordinator and USCG personnel at the Incident Command Post located at the NOAA Disaster Response Center. Image Credit: NOAA

- Novel virus required adaptive changes to standard operational protocols
- Resource limitations
  - Pandemic impact on normal facility staffing
  - Supplies
  - Testing
- Enforcement
- Ability to implement hybrid IMT operations
- Response "culture" and "risk-tolerance"
- Confluence of "response world" and "home/ family"
- Difficult to garner health and safety information outside of the IMT

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Mitigations

- Rigorous COVID19 health and safety protocols
  - Signage
  - Self screening
  - Capacity limitations
  - Workspace limitations
  - Outdoor dining
  - Encouraged outdoor "ops briefs"
  - After hours cleaning/disinfecting space
- Enhanced communication and coordination with Incident Management Team's Safety Officer and Assistant Safety Officers
- Briefs / reinforcement

Disaster Response Center – Base of Operations for Hurricane Sally Marine Environmental Response. Image Credit: NOAA

81

2021 Hurricane Season

Displaced vessel post - Hu Sally. Image Credit: NOAA

- Define success by responder health and well-being
- Continue to adapt COVID19 health & safety protocols
- Alternative working arrangements tested under real world situations
  - Virtual, in-person and hybrid staffing strategies
  - Efficiencies gained in virtual collaboration tools
- Response organization enhancement
  - Safety Officer and Medical Officer
- Err on the side of caution

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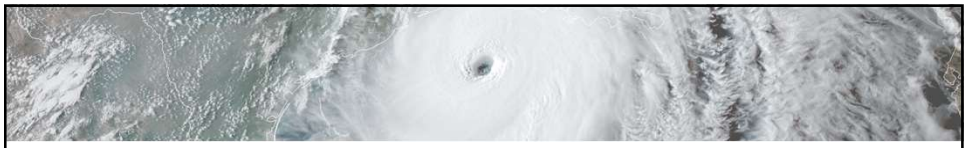

Lauren Nash

Warning Coordination Meteorologist
NOAA National Weather Service New Orleans/Baton Rouge

June 21, 2021

National Ocean Service

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Working Toward Disaster Resilience in the SE & Carib Region

Geno Olmi
NOAA Southeast and Caribbean Regional Collaboration Team (SECART)

2021 NOS Hurricane Preparedness Summit

NOAA SOUTHEAST & CARIBBEAN

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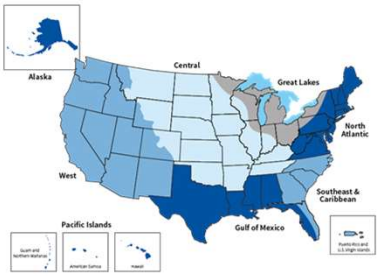
NOAA Regional Collaboration

Improving NOAA's service to the Nation through collaboration



Regional Collaboration

Eight Regional Teams
165 Team Members

Purpose: To identify, communicate, and respond to regional needs, catalyze collaboration; and connect people and capabilities to advance NOAA's mission and priorities.

Cross Line Office and partner teams

NOAA SOUTHEAST & CARIBBEAN

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NOAA Disaster Resilience in the SE & Carib Region

Multi-year effort with DPP/DRC to improve NOAA resilience in the region

- 2017 workshop/exercise
  - Better understand office roles and responsibilities
  - Training on NOAA "tools" for disaster communication
  - Scenario exercise - major east coast hurricane (Max's Mayhem)
- 2018 Workshop
  - Lessons learned from Hurricanes Irma and Maria
- 2019 Workshop/exercise
  - Revisit 2017 scenario with focus on recovery
- ICS300 Training (CHS in 2019)
- 2020 Workshop/Exercise (postponed)
  - With SC EMD; roles and responsibilities during major earthquake

NOAA SOUTHEAST & CARIBBEAN

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Some "takeaways"

- Great value in (and desire for) bringing NOAA offices together to better understand roles and responsibilities and make connections.
- Yes, but not all offices were represented and workshops did not include key partners (yet).
- Trainings and exercises appreciated.
- Desire (internal and external) for regional "guide" for NOAA roles and contact information.
- NOAA "disaster management" tools useful but mostly LO specific.

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Some "takeaways" (cont)

- Sharing of resources (emergency plans, COOPs, equipment, backup personnel) is not widespread, but desired.
- Incident Stress Management was/is a big issue and avenues for assistance were not clear
- Different guidance to Fed and Contract staff in same office leads to confusion
- Emergency Notification System messages from different levels (i.e., HSPO and local office) can lead to confusion
- Not clear what role Regional Collaboration Teams should have, if any, in coordination before/during/after a disaster

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What Now?

SECART's Current and Anticipated Activities

- Annual Hurricane Awareness Webinar Series (with NHC)
- Working hard to complete the Guide to NOAA Integrated Disaster Resources in SE & Carib (draft distributed soon?).
- Earthquake Disaster Exercise with SC EMD postponed again in FY21 - now planning for FY22.
- Would like to get back to regional scale workshops, exercises, trainings, and resources.
- Continue partnering with DPP

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Most Regional Collaboration Teams Doing Something on Preparedness / Resilience

- Guides to NOAA Disaster Information (Great Lakes, Pacific)
- Disaster Exercises (mostly with DPP) (Gulf, West, Pacific)
- Workshops to enhance understanding of roles and contacts (including in the ICS structure) (Alaska, Pacific, West)
- Webinars on tropical weather, preparedness (Gulf, Central)

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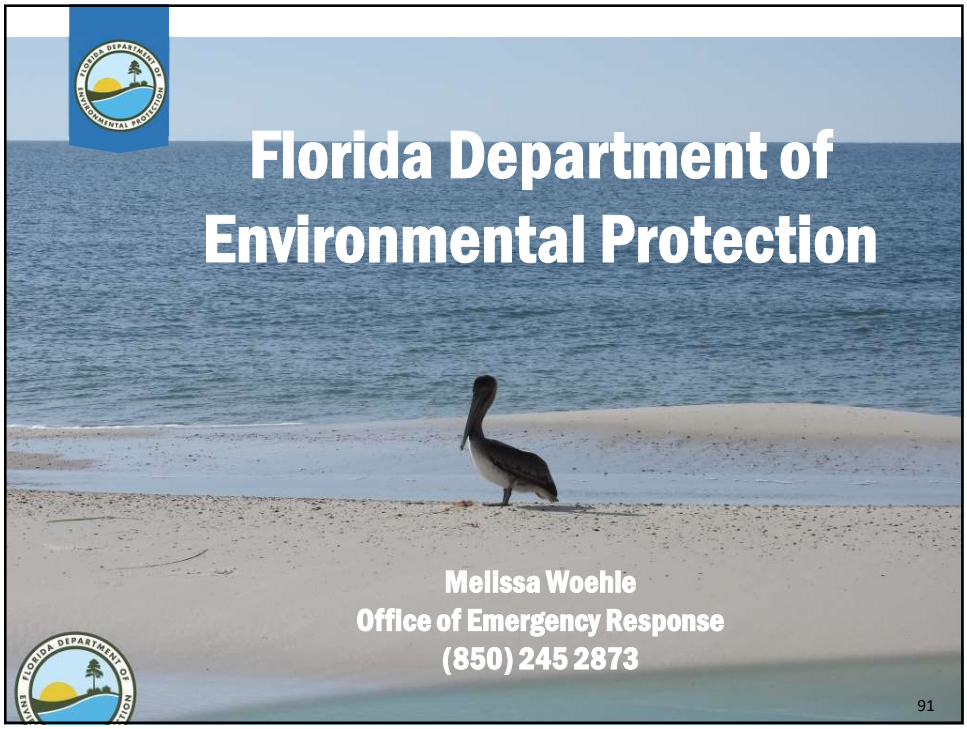
Florida Department of Environmental Protection
Melissa Woehle
Office of Emergency Response
(850) 245 2873
91

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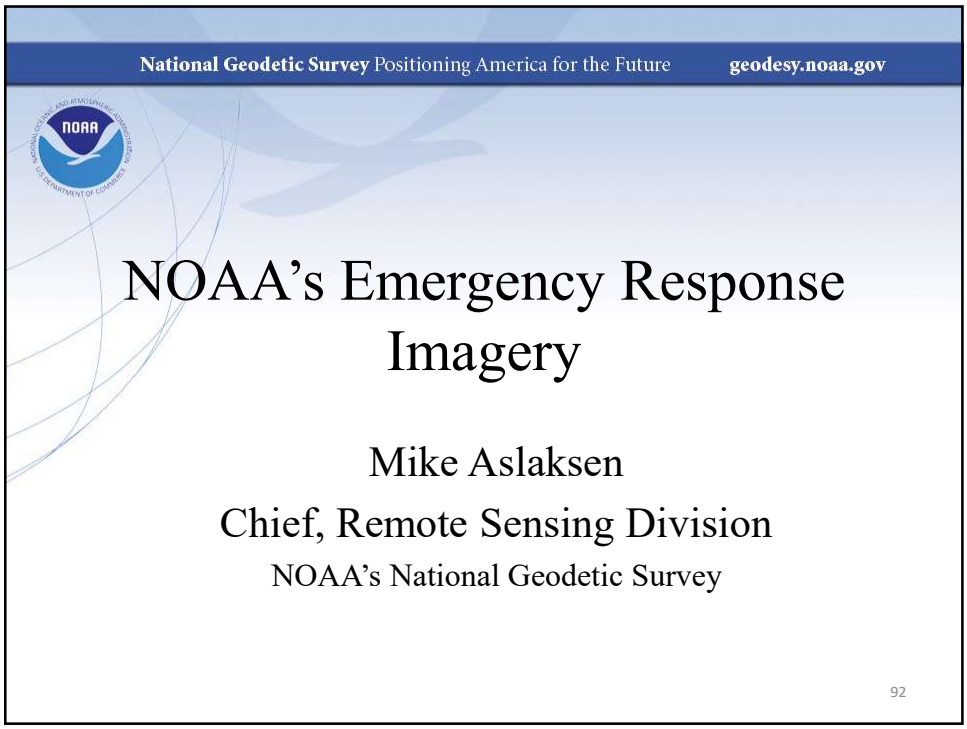
National Geodetic Survey Positioning America for the Future geodesy.noaa.gov
NOAA's Emergency Response Imagery
Mike Aslaksen
Chief, Remote Sensing Division
NOAA's National Geodetic Survey
92

92

NOAA's National Geodetic Survey Positioning America for the Future geodesy.noaa.gov

BLUF

After Image: NOAA

93

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NOAA's National Geodetic Survey Positioning America for the Future geodesy.noaa.gov

Emergency Response Imagery

- Support NOAA's requirements and NRF Emergency Support Functions:

ESF 1	Transportation
ESF 11	Agriculture and Natural Resources
ESF 3	Public Works and Engineering
ESF 9	Search and Rescue
ESF 10	Oil and Hazardous Material Response
ESF 13	Public Safety and Security
ESF 14	Long-term Community Recovery and Mitigation

- Pre-Scripted Mission Assignments (PSMA) With FEMA

94

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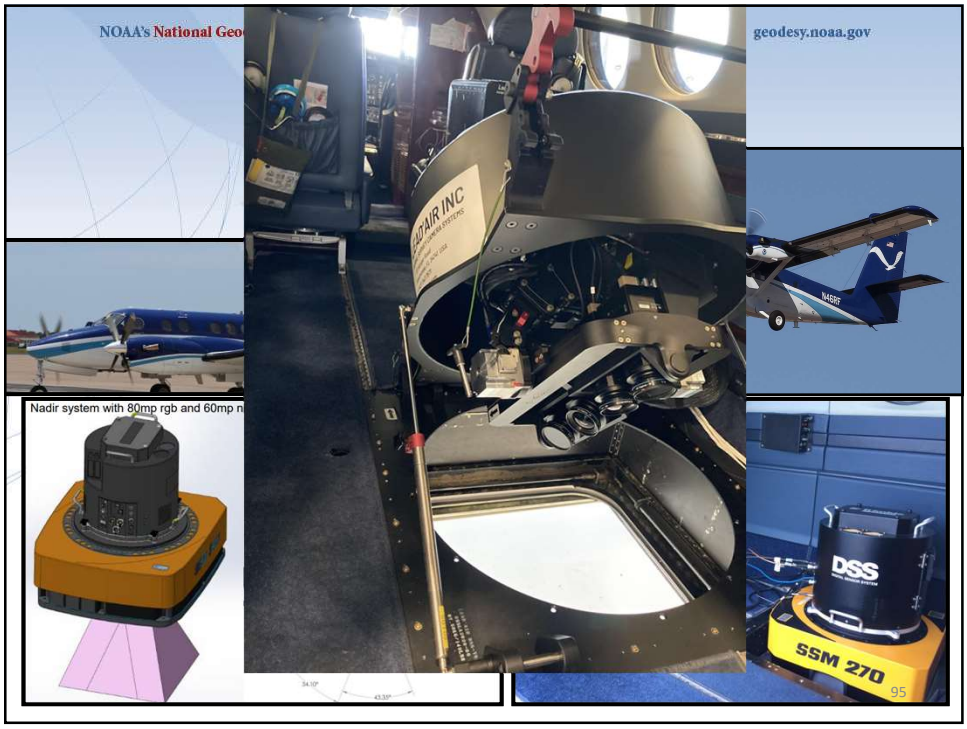
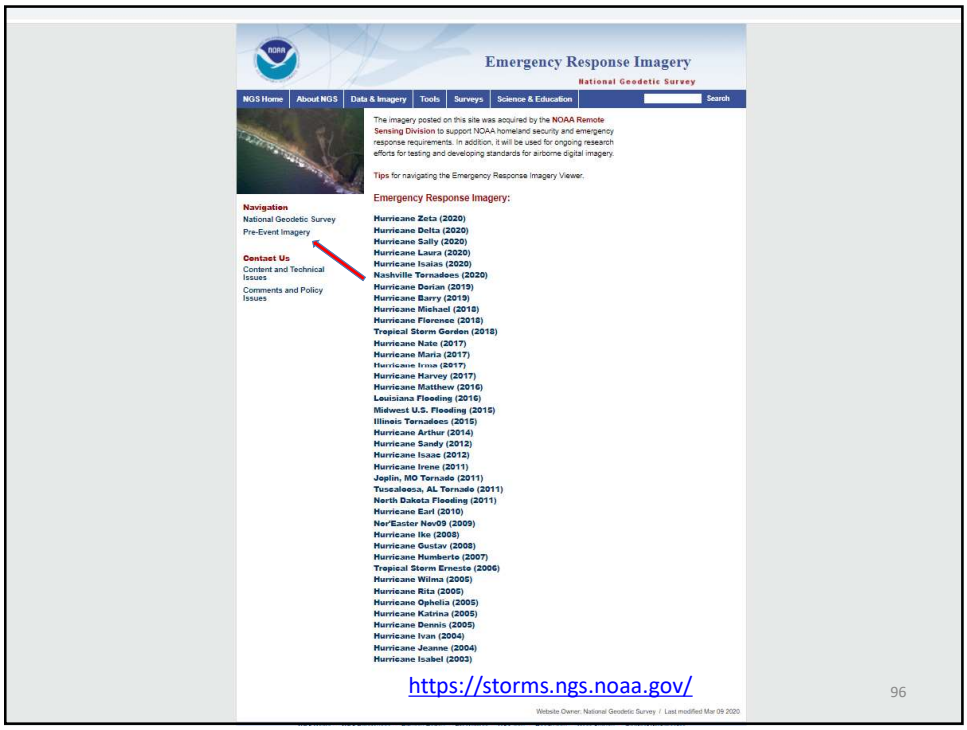

NOAA's National Geo
geodesy.noaa.gov
Nadir system with 80mp rgb and 60mp n
DSS
SSM 270
95

95


Emergency Response Imagery
National Geodetic Survey
NGS Home
About NGS
Data & Imagery
Tools
Surveys
Science & Education
Search
The imagery posted on this site was acquired by the NOAA Remote Sensing Division to support NOAA homeland security and emergency response requirements. In addition, it will be used for ongoing research efforts for testing and developing standards for airborne digital imagery.
Tips for navigating the Emergency Response Imagery Viewer.
Navigation
National Geodetic Survey
Pre-Event Imagery
Contact Us
Content and Technical Issues
Comments and Policy Issues
Emergency Response Imagery:
Hurricane Zeta (2020)
Hurricane Delta (2020)
Hurricane Sally (2020)
Hurricane Laura (2020)
Hurricane Isaias (2020)
Nashville Tornadoes (2020)
Hurricane Dorian (2019)
Hurricane Barry (2019)
Hurricane Michael (2018)
Hurricane Florence (2018)
Tropical Storm Gordon (2018)
Hurricane Nate (2017)
Hurricane Maria (2017)
Hurricane Irma (2017)
Hurricane Harvey (2017)
Hurricane Matthew (2016)
Louisiana Flooding (2016)
Midwest U.S. Flooding (2015)
Illinois Tornadoes (2015)
Hurricane Arthur (2014)
Hurricane Sandy (2012)
Hurricane Isaac (2012)
Hurricane Irene (2011)
Joplin, MO Tornado (2011)
Tuscaloosa, AL Tornado (2011)
North Dakota Flooding (2011)
Hurricane Earl (2010)
Nor'Easter Nov09 (2009)
Hurricane Ike (2008)
Hurricane Gustav (2008)
Hurricane Humberto (2007)
Tropical Storm Ernesto (2006)
Hurricane Wilma (2005)
Hurricane Rita (2005)
Hurricane Ophelia (2005)
Hurricane Katrina (2005)
Hurricane Dennis (2005)
Hurricane Ivan (2004)
Hurricane Jeanne (2004)
Hurricane Isabel (2003)
https://storms.ngs.noaa.gov/
Website Owner: National Geodetic Survey / Last modified Mar 09 2020
96

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(1) the challenges and limitations of hurricane response and recovery activities during a pandemic

- Available personnel due to COVID-19 safety procedures (testing, shelter in place, cohort crew approach, etc.)
- Limited flexibility for base of operations (limiting multiple travel locations, avoiding high risk locations, select locations for data transfer, safe distance from storm impacts, etc.)
- Shorter on station time due to longer transits (ex. operating from Mobile, AL for TS Isaias)
- Decentralized support and requirements

(1) (2) best practices shared by the internal and external partners as we prepare for a possible major hurricane landfall.

- Train like you fight – acceptance operations is allowing us to work through the issues listed above
- Use of non traditional tools to meet requirements – ex FEMA exploring the use of imagery for damage assessment instead of sending onsite inspectors

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Summary

- Data has been acquired to support emergency response efforts due to hurricanes, flooding, earthquakes, and tornadoes since the mid-1960s.
- Data is disseminated to federal, state, and local government agencies, as well as the general public to facilitate support efforts
- Imagery (typically nadir and/or oblique) is collected, processed, and disseminated in GIS ready formats
- Goal: processed and available 6-8 hours after landing
- Technical Questions: ngs.hurricane1@noaa.gov
- POC Mike Aslaksen mike.aslaksen@noaa.gov 301-801-9024

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NOAA's National Ocean Service / Office of Response & Restoration
OR&R
THE NOAA SCIENTIFIC SUPPORT TEAM - SERVING THE FOSC AND UNIFIED COMMAND
Improving Emergency Support Function (ESF) 10 for Hurricane Response
Bradford Benggio - NOAA Scientific Support Coordinator & RRT Representative
OFFICE OF RESPONSE AND RESTORATION • NOAA's NATIONAL OCEAN SERVICE

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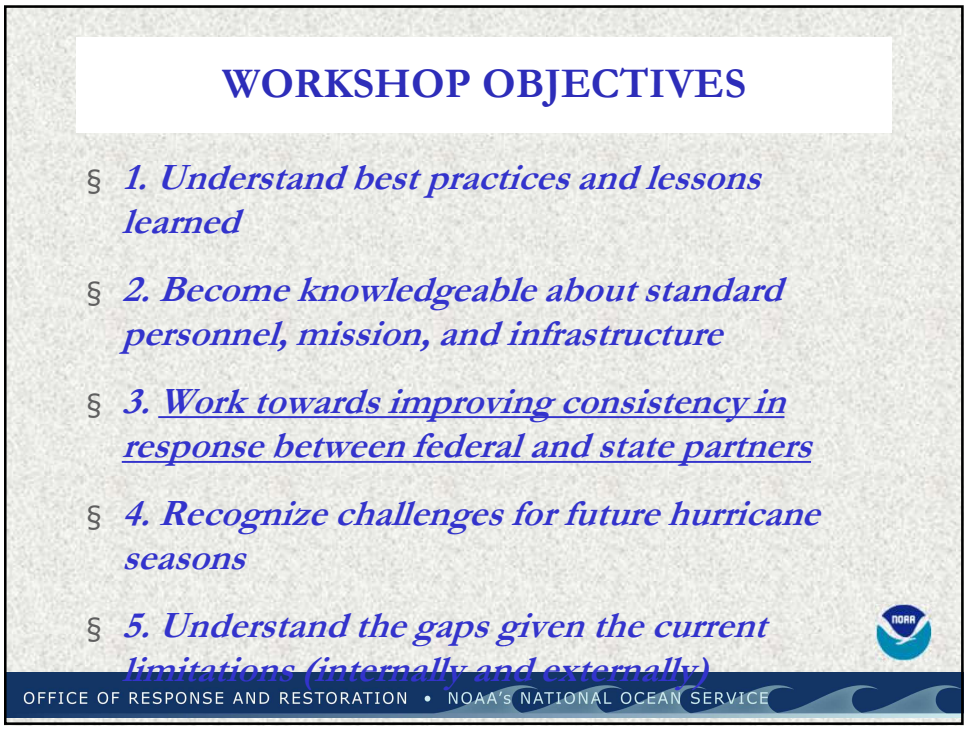
WORKSHOP OBJECTIVES
§ 1. Understand best practices and lessons learned
§ 2. Become knowledgeable about standard personnel, mission, and infrastructure
§ 3. Work towards improving consistency in response between federal and state partners
§ 4. Recognize challenges for future hurricane seasons
§ 5. Understand the gaps given the current limitations (internally and externally)
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ESF 10 Workgroup

- *Initial Meeting 18 March 2021: NOAA Office of Response and Restoration (Disaster Preparedness Program & Emergency Response Division) & USCG (D7, D8, Marine Environmental Response Team, & the National Pollution Fund Center*
- *Goals: Identify existing and reoccurring issues that could be addressed to improve preparedness, consistency, and coordination for ESF10 hurricane responses*
- *Also to work with other partners including the Environmental Protection Agency, the Federal Emergency Management Administration, and States*

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Consensus Issues for Workgroup Focus

- *Clear and consistent policy guidance for addressing ESF 10 (pollution) & ESF 3 (debris)*
- *Identify long term response activities as either 1) true emergency response, or 2) transition to more routine recovery project management operations*
- *Need to conduct joint federal and state hotwashes post each ESF 10 response to share lessons learned and areas for improvement*

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Consensus Issues for Workgroup Focus (cont)

- *Better understanding of needs and coordination during each of the 5 phases of an ESF 10 hurricane response: 1) pre-storm landfall, 2) active storm landfall, 3) planning and inventory(post landfall), 4) implementation/response, 5) mission closeout*
- *Better understanding of the drivers from States' perspectives on what will lead to a ESF 10 federal support request to FEMA*
- *Development of common data collection, data management and common operating picture support*

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Future Vision and Outcomes of the Workgroup

- *Improved interagency connectivity, coordination and preparedness and response with recommendations for increased consistency, coordination, and support*
- *Better common understanding of ESF mission assignment guidance and response implementation along with improving expectation management, resource use planning, preparedness, and allocations of resources*
- *Creation of a joint Best Management Guidebook for ESF 10 hurricane response*
- *Development and execution of joint ESF10 displaced vessel and pollution response exercise prior to the 2022 hurricane season*

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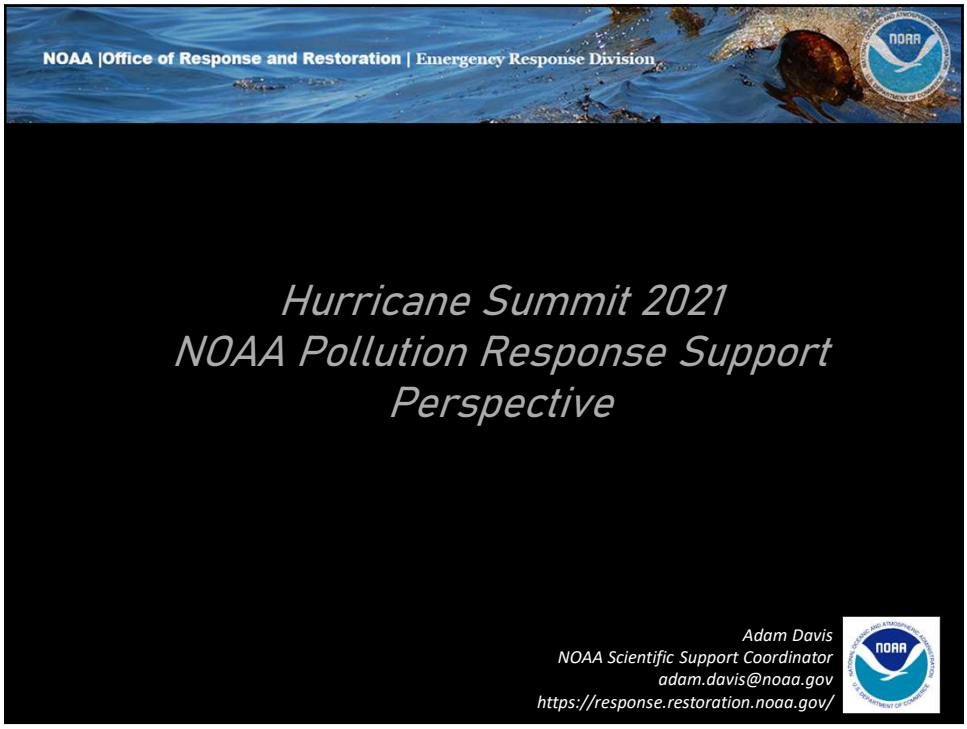
NOAA |Office of Response and Restoration | Emergency Response Division
Hurricane Summit 2021
NOAA Pollution Response Support
Perspective
Adam Davis
NOAA Scientific Support Coordinator
adam.davis@noaa.gov
https://response.restoration.noaa.gov/

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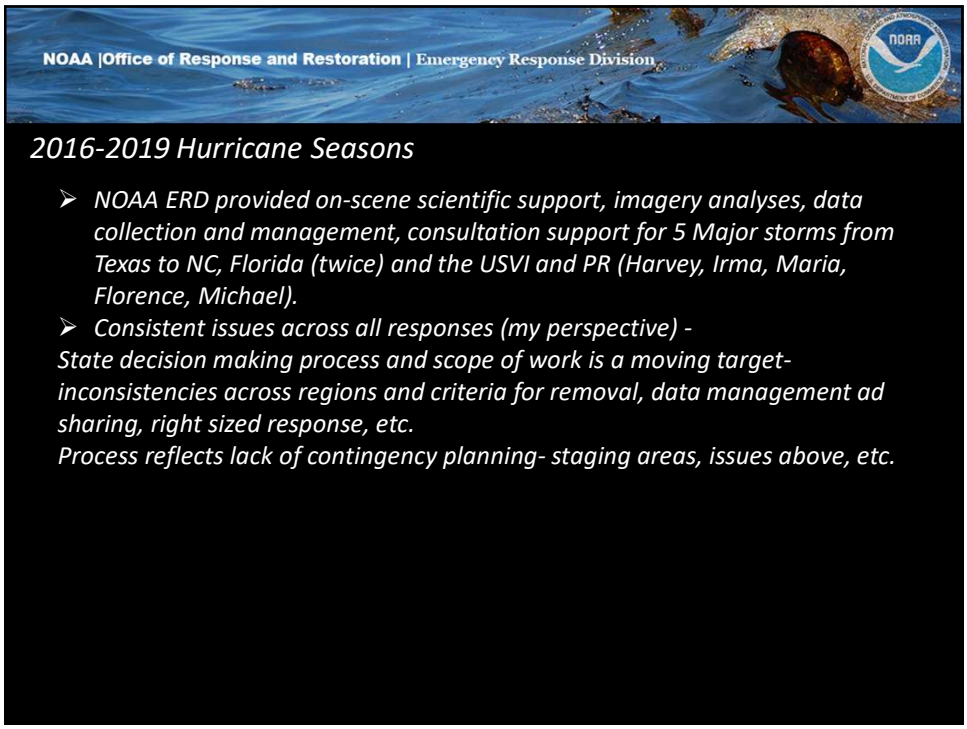
NOAA |Office of Response and Restoration | Emergency Response Division
2016-2019 Hurricane Seasons
NOAA ERD provided on-scene scientific support, imagery analyses, data collection and management, consultation support for 5 Major storms from Texas to NC, Florida (twice) and the USVI and PR (Harvey, Irma, Maria, Florence, Michael).
Consistent issues across all responses (my perspective) -
State decision making process and scope of work is a moving target- inconsistencies across regions and criteria for removal, data management ad sharing, right sized response, etc.
Process reflects lack of contingency planning- staging areas, issues above, etc.

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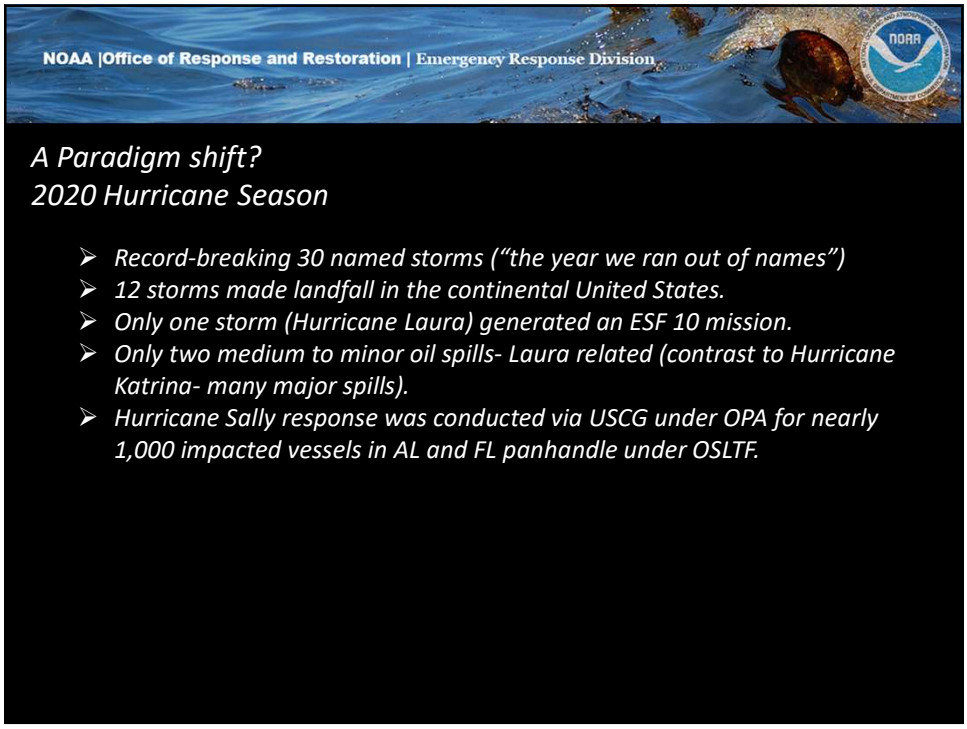
NOAA |Office of Response and Restoration | Emergency Response Division
A Paradigm shift?
2020 Hurricane Season
Record-breaking 30 named storms ("the year we ran out of names")
12 storms made landfall in the continental United States.
Only one storm (Hurricane Laura) generated an ESF 10 mission.
Only two medium to minor oil spills- Laura related (contrast to Hurricane Katrina- many major spills).
Hurricane Sally response was conducted via USCG under OPA for nearly 1,000 impacted vessels in AL and FL panhandle under OSLTF.

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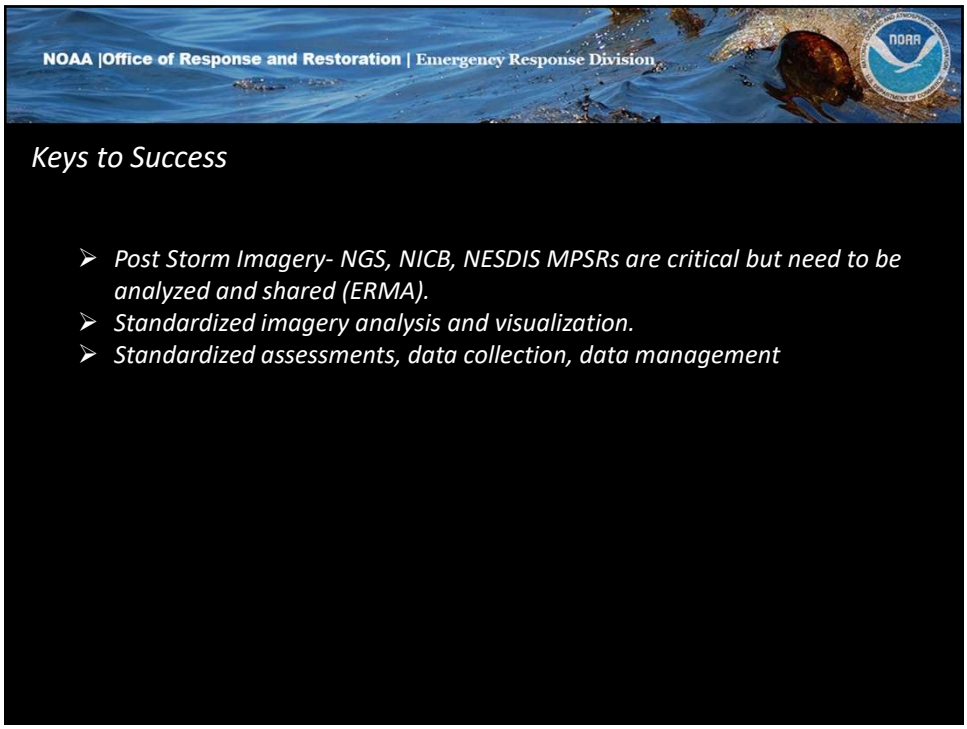
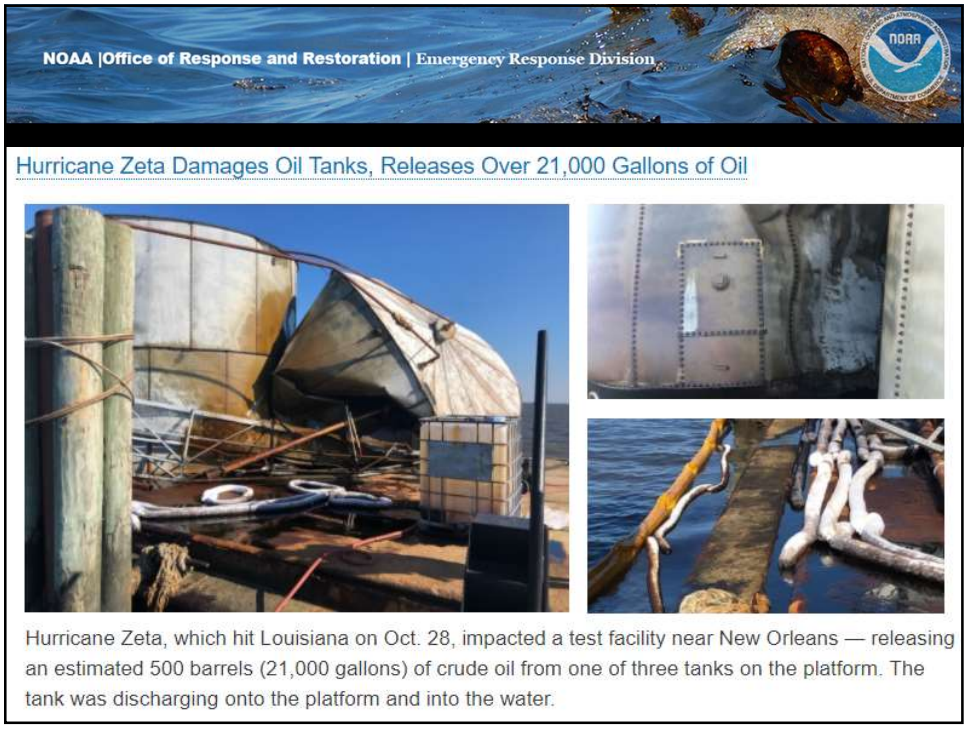
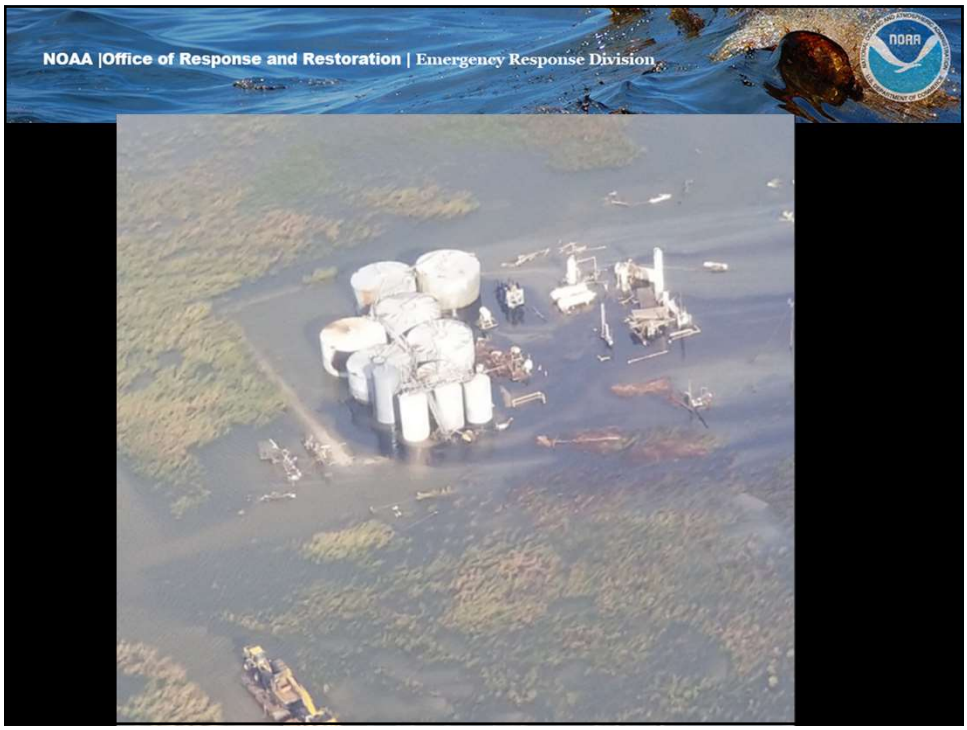

NOAA |Office of Response and Restoration | Emergency Response Division
Keys to Success
Post Storm Imagery- NGS, NICB, NESDIS MPSRs are critical but need to be analyzed and shared (ERMA).
Standardized imagery analysis and visualization.
Standardized assessments, data collection, data management

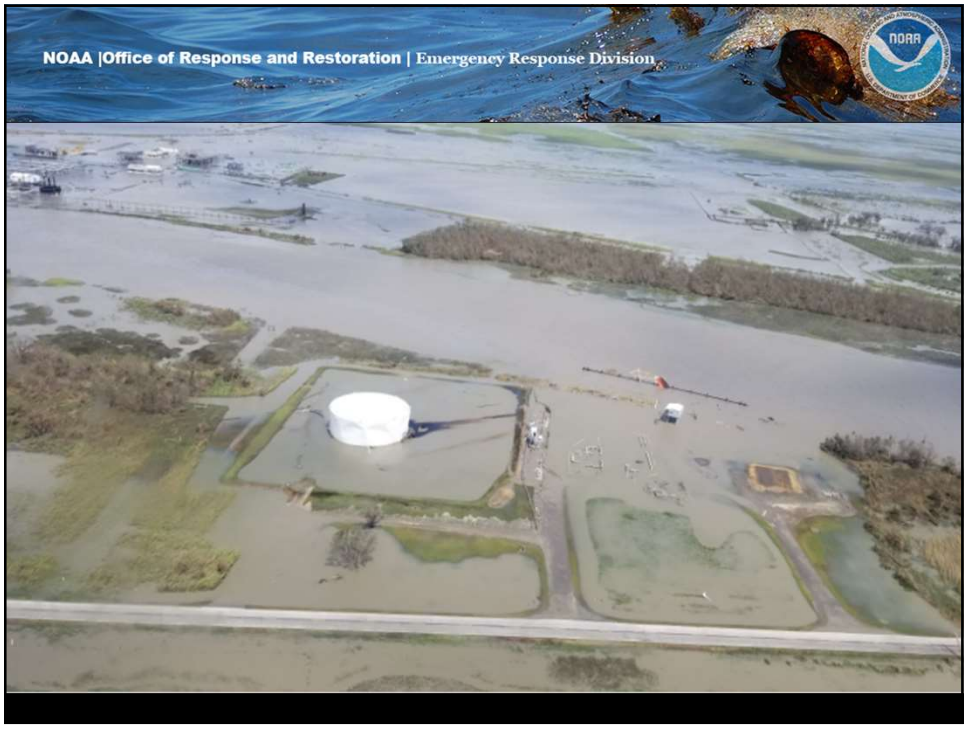
108


NOAA |Office of Response and Restoration | Emergency Response Division
Hurricane Zeta Damages Oil Tanks, Releases Over 21,000 Gallons of Oil
Hurricane Zeta, which hit Louisiana on Oct. 28, impacted a test facility near New Orleans — releasing an estimated 500 barrels (21,000 gallons) of crude oil from one of three tanks on the platform. The tank was discharging onto the platform and into the water.

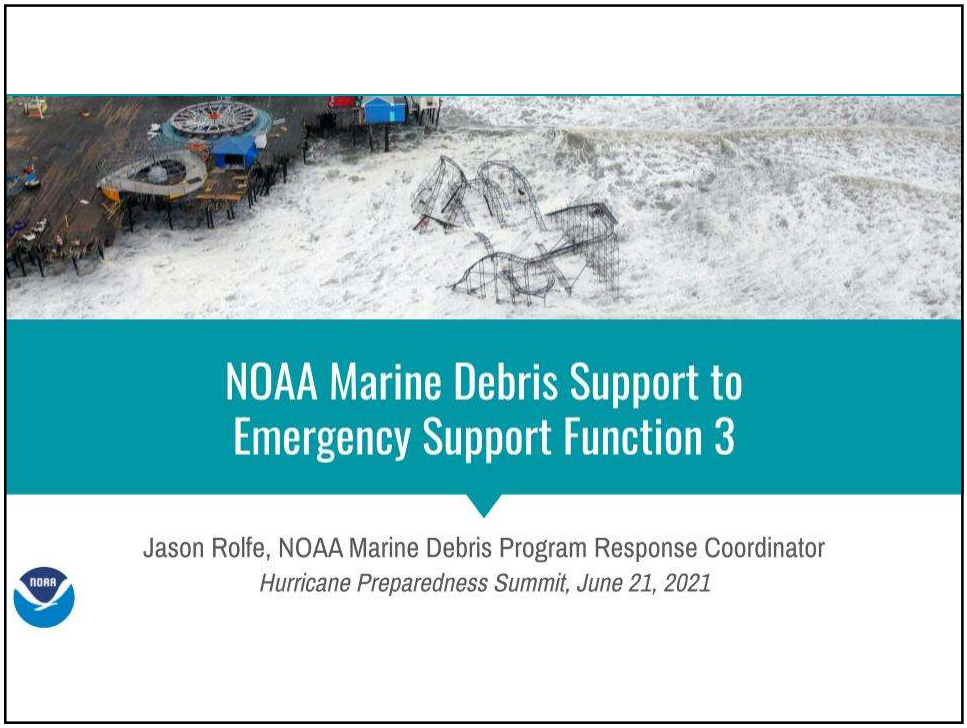
109


NOAA |Office of Response and Restoration | Emergency Response Division

110


NOAA |Office of Response and Restoration | Emergency Response Division

111


NOAA Marine Debris Support to
Emergency Support Function 3
Jason Rolfe, NOAA Marine Debris Program Response Coordinator
Hurricane Preparedness Summit, June 21, 2021

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NOAA Marine Debris Program

Established in 2006 by Congress as the U.S. federal lead for marine debris.

6 Goals:

1. Regional Coordination
2. Response
3. Removal
4. Prevention
5. Monitoring & Detection
6. Research

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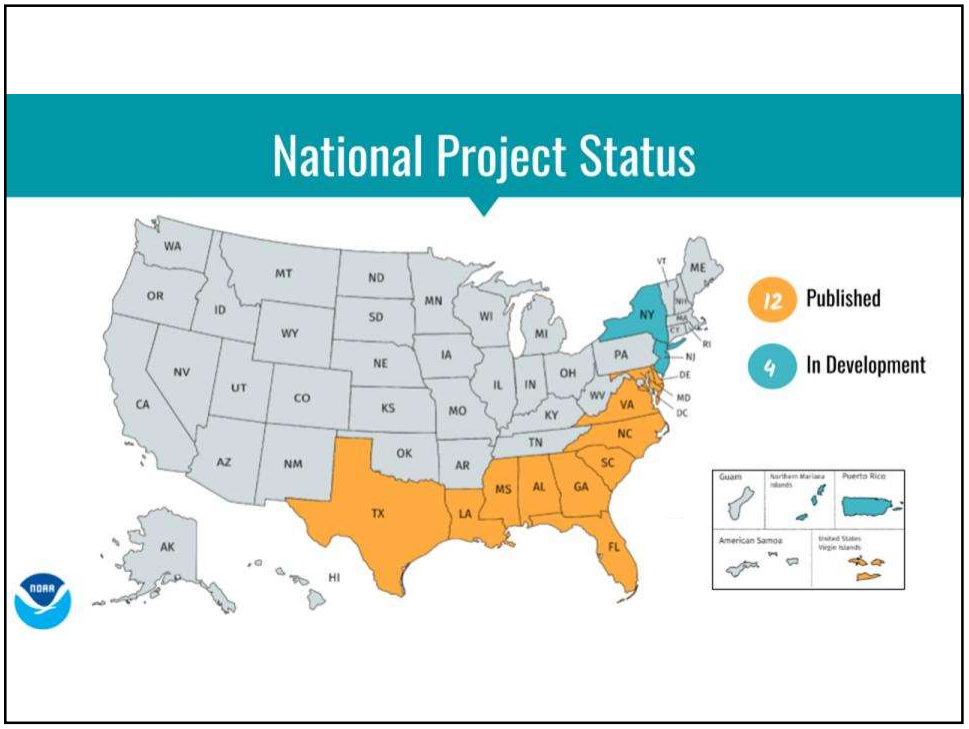
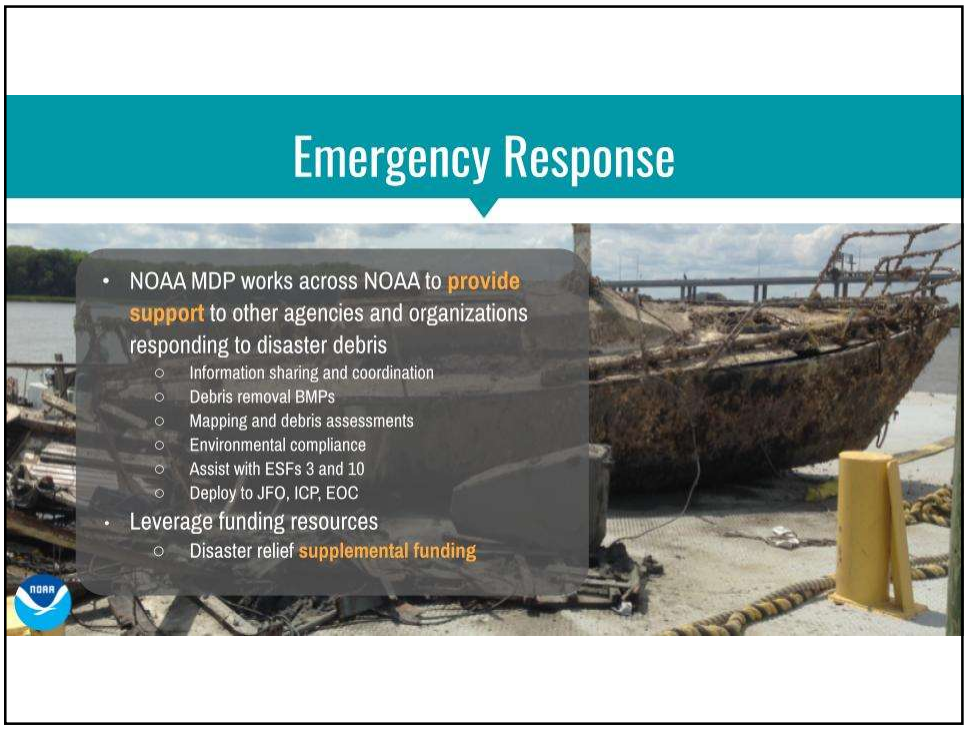
Response Guides

114


National Project Status
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
GA
FL
SC
NC
VA
PA
NY
ME
VT
NH
MA
CT
RI
NJ
DE
MD
DC
AK
HI
12 Published
4 In Development
Guam
Northern Mariana Islands
Puerto Rico
American Samoa
United States Virgin Islands

115


Emergency Response
• NOAA MDP works across NOAA to provide support to other agencies and organizations responding to disaster debris
○ Information sharing and coordination
○ Debris removal BMPs
○ Mapping and debris assessments
○ Environmental compliance
○ Assist with ESFs 3 and 10
○ Deploy to JFO, ICP, EOC
• Leverage funding resources
○ Disaster relief supplemental funding

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NOS Hurricane Preparedness Summit
Steve Goldstein
NOAA Liaison (LNO) to FEMA HQ

June 21 2021

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NOAA LNO TO FEMA HQ

- NOAA/NWS has a Liaison Officer (LNO) permanently located at FEMA HQ in downtown Washington D.C.
- Provides situational awareness of high-impact meteorological, hydrological and space weather events of national significance at the FEMA Daily Operations Briefing.
- Supports all phases of the disaster life cycle (preparedness, response, recovery and mitigation) through targeted outreach and training as well as activities related to disaster operations.
- Supports:
  - FEMA Planning with development of future plans.
  - FEMA Analytics and Geospatial Section to develop analytical products using NOAA datasets.
  - FEMA Exercise Division to develop weather-related injects that meet exercise objectives.
  - FEMA Recovery and Disaster Declarations Unit in providing weather data and analysis in support of the Presidential Disaster Declaration process.
  - The Emergency Support Function Leadership Group (ESFLG) and Modeling Data Working Group (MDWG).
- Serves as NOAAs Technical Specialist during activations of the National Response Coordination Center.
- Ensures FEMA teams are aware of the full suite of response and recovery capabilities within other NOAA Line Offices.

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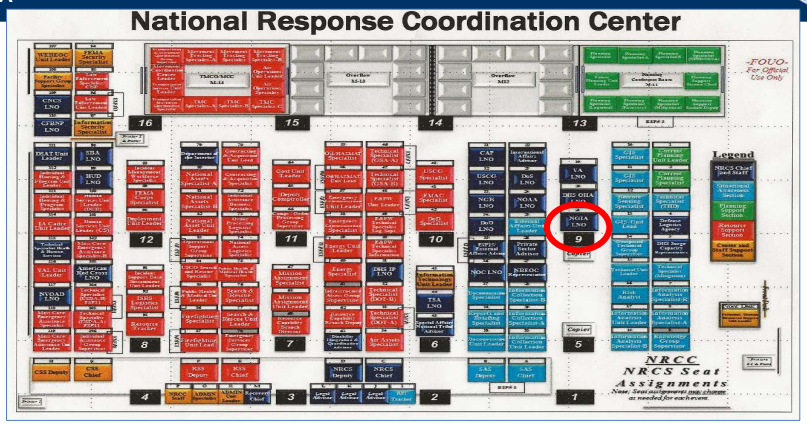
FEMA

National Response Coordination Center



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FEMA

2020 vs. 2021 Hurricane Season

For Discussion by ESF:

1. What, if any, mission readiness shortfalls have you experienced for deployable teams or resources? Is there a mitigation strategy?
2. What are the limiting factors for the ESF to maintain staffing at the NRCC, RRCCs, or JFOs/IOFs? If so, is there a mitigation strategy?
3. What challenges, limiting factors and/or unmet requirements will impact the readiness status of ESF deployable assets or resources? How can these be mitigated?
4. What adjustments have been made to Concepts of Operations in anticipation of evolving and emergent incidents throughout the 2020 disaster seasons that may require response operations while continuing to operate in a COVID-19 environment?

120

FEMA HQ: ESF – 3/10

- Prepared for the 2021 season.
- Worked through sustainment and readiness fronts and adjustments.
- Temporary power, generator staging base, tablets and equipment may be impacted by chip shortages.
- Rental cars are of concern at certain locations.
- A lot of changes in staff.
- Requesting an early deployment to enhance planning.
- Staff shortages identified.
- ESF 10: prepared for the potential to return to a closed environment.

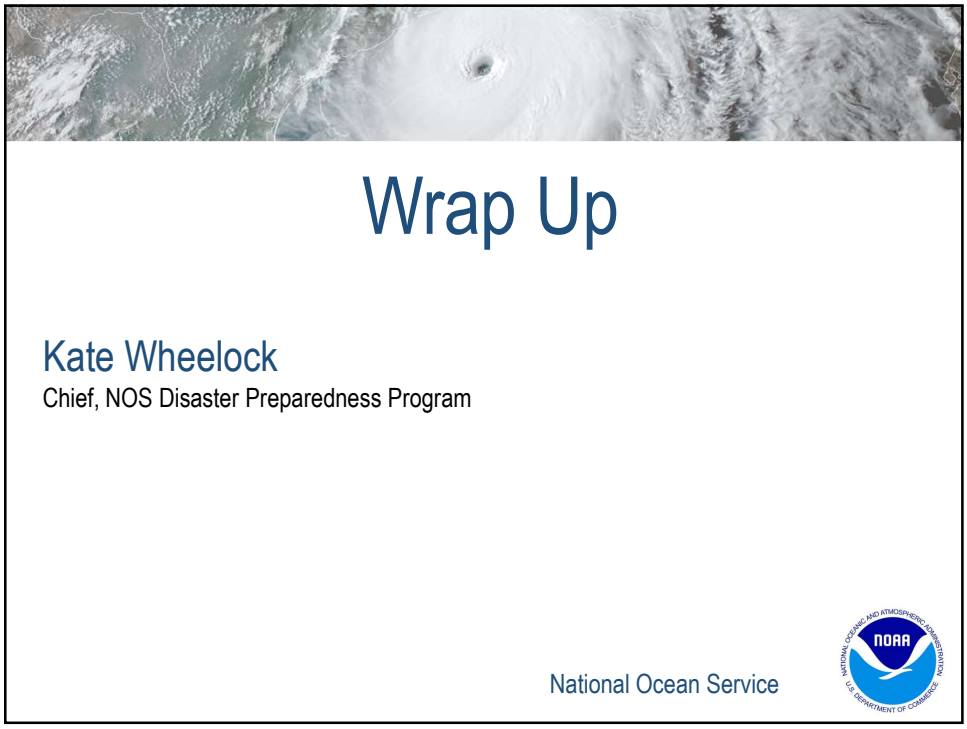
121

QUESTIONS

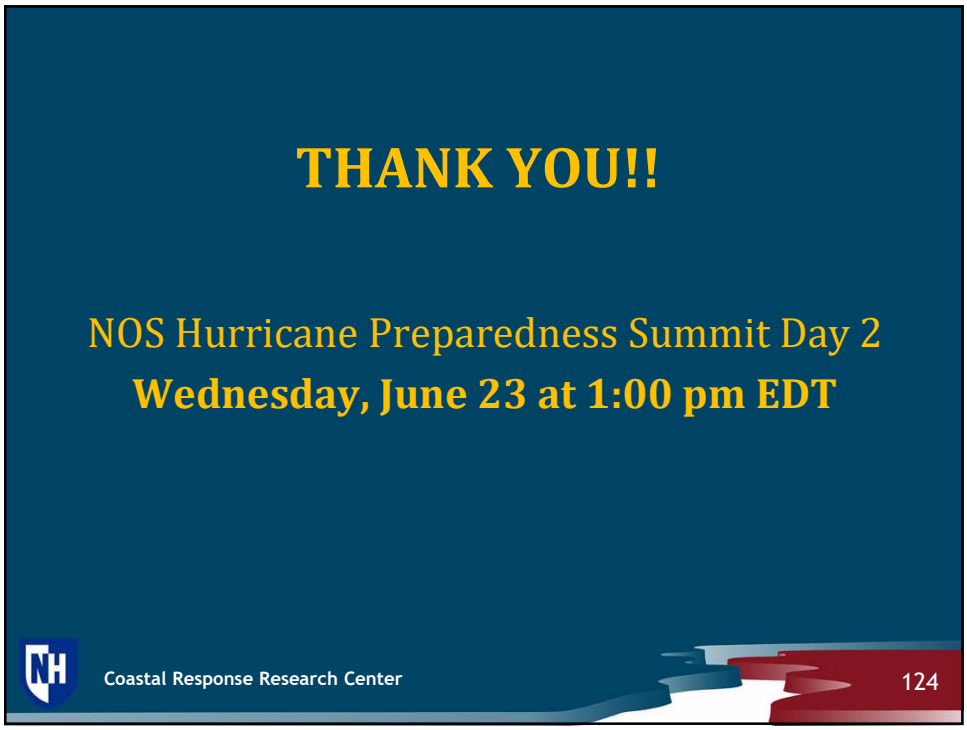
My contact information:

Steve Goldstein
Steve.goldstein@noaa.gov
Steven.goldstein@associates.fema.dhs.gov
240-687-1671 (cell)

122


Wrap Up
Kate Wheelock
Chief, NOS Disaster Preparedness Program
National Ocean Service

123


THANK YOU!!
NOS Hurricane Preparedness Summit Day 2
Wednesday, June 23 at 1:00 pm EDT
Coastal Response Research Center
124

124

2021 NOS Hurricane Preparedness Summit

Nancy E. Kinner, Facilitator
Coastal Response Research Center (CRRC)
University of New Hampshire

June 23, 2021

Coastal Response Research Center

1
1

1

HOW TO PARTICIPATE

- **Attendees:** Muted & camera off
- **Panelists:** Unmute & turn on camera ONLY when speaking
- **Interactive Polls:** Exit full screen mode to view polls
- Download GoToWebinar application vs online browser

- **If you have any access issues, please contact Kathy at kathy.mandsager@unh.edu or cell 603.498.8010**

Coastal Response Research Center

2

2

'Questions' Tool

- **Type questions as you think of them**
  - No need to wait until the Q&A session in the agenda
- Located in main tool bar
- Questions will be monitored and collated
- Questions may be announced or addressed in the 'Questions' Tool

Coastal Response Research Center 3

3

Raise "Hand"

- Green = Raised
- Gray = Lowered

Upon invitation, unmute and ask your question verbally by using the raise "hand" tool in your tool bar.

Coastal Response Research Center 4

4

STEERING COMMITTEE

Jeff Cupo, NOAA NWS
Charlie Henry, NOAA OR&R GoM DRC
Brad Benggio, NOAA OR&R ERD
Matthew Chasse, NOAA OCM
LT John Kidd, NOAA NRT
Lisa Symons, NOAA ONMS
Cory Rhodes, NOAA OR&R GoM DRC
LCDR Megan Guberski, NOAA OMAO
Nancy Kinner, UNH CRRC
Katie Perry, UNH CRRC

5

THANK YOU FOR LISTENING

Please answer quick 10-question poll after Summit!

https://crrc.unh.edu/nos-hurricane-summit-2021

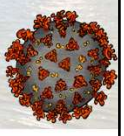
6

Managing COVID-19 Fatigue During
A Large Maritime Response
By
Randy T. Ashmore
(CEM/EMT)
Of
Gallagher Marine Systems
www.gallaghermarine.com

7

Some Numbers

- Some Rough numbers
  - Over 650 Days of Response w/ 460 Days of COVID-19
  - 350-500 responders at any given time
  - Upward of 7,500 total staffing rotations
  - Less than 30 cases of COVID-19
- Earliest COVID-19 case on the response was 26 June 20
- 3 "waves" of COVID-19
  - Stopped the spread / broke the chain



8

So … how did we manage COVID-19 Fatigue Burn-out on the response?

9

Fatigue & Complacency

- Setting the Stage
  - Medical Advisor/Officer
  - Vetted Sources
- Consistent but varied Messaging
  - Factual Messaging
  - Positive Messaging

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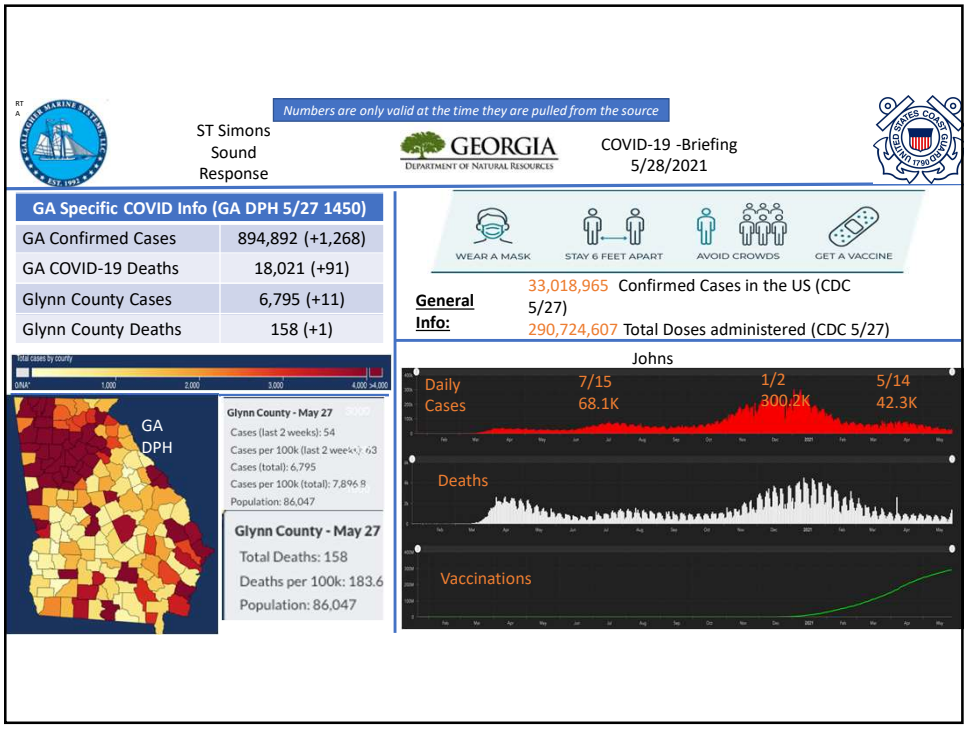
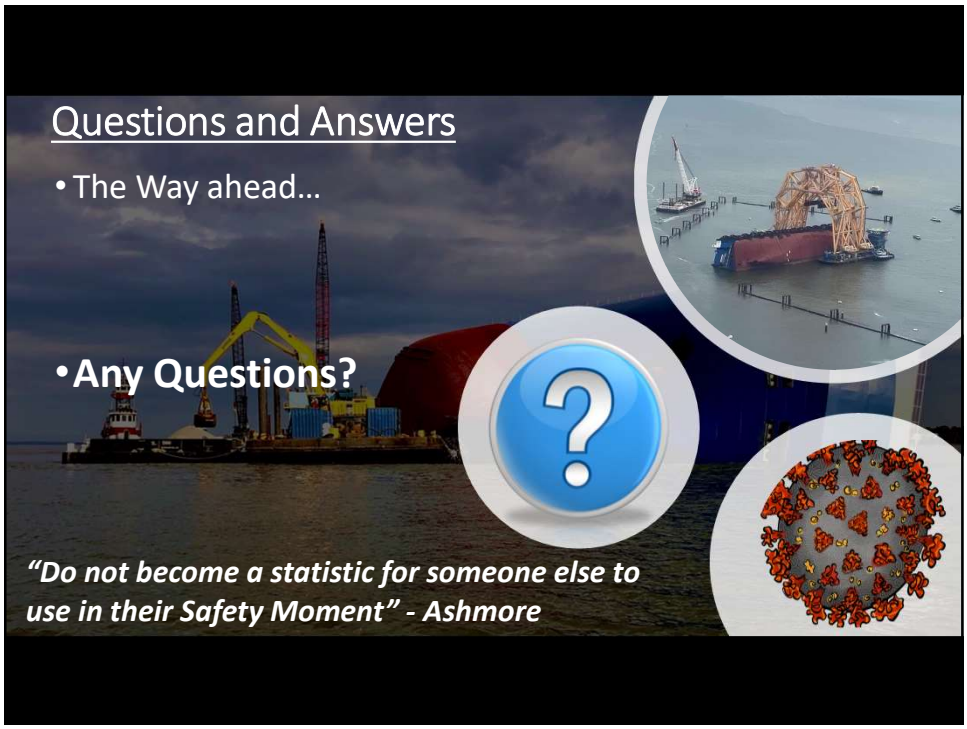

ST Simons Sound Response
Numbers are only valid at the time they are pulled from the source
GEORGIA
DEPARTMENT OF NATURAL RESOURCES
COVID-19 -Briefing 5/28/2021
GA Specific COVID Info (GA DPH 5/27 1450)
GA Confirmed Cases 894,892 (+1,268)
GA COVID-19 Deaths 18,021 (+91)
Glynn County Cases 6,795 (+11)
Glynn County Deaths 158 (+1)
WEAR A MASK
STAY 6 FEET APART
AVOID CROWDS
GET A VACCINE
General Info:
33,018,965 Confirmed Cases in the US (CDC 5/27)
290,724,607 Total Doses administered (CDC 5/27)
GA DPH
Glynn County - May 27
Cases (last 2 weeks): 54
Cases (total): 6,795
Population: 86,047
Glynn County - May 27
Total Deaths: 158
Deaths per 100k: 183.6
Population: 86,047
Johns
Daily Cases
7/15 68.1K
1/2 300.2K
5/14 42.3K
Deaths
Vaccinations

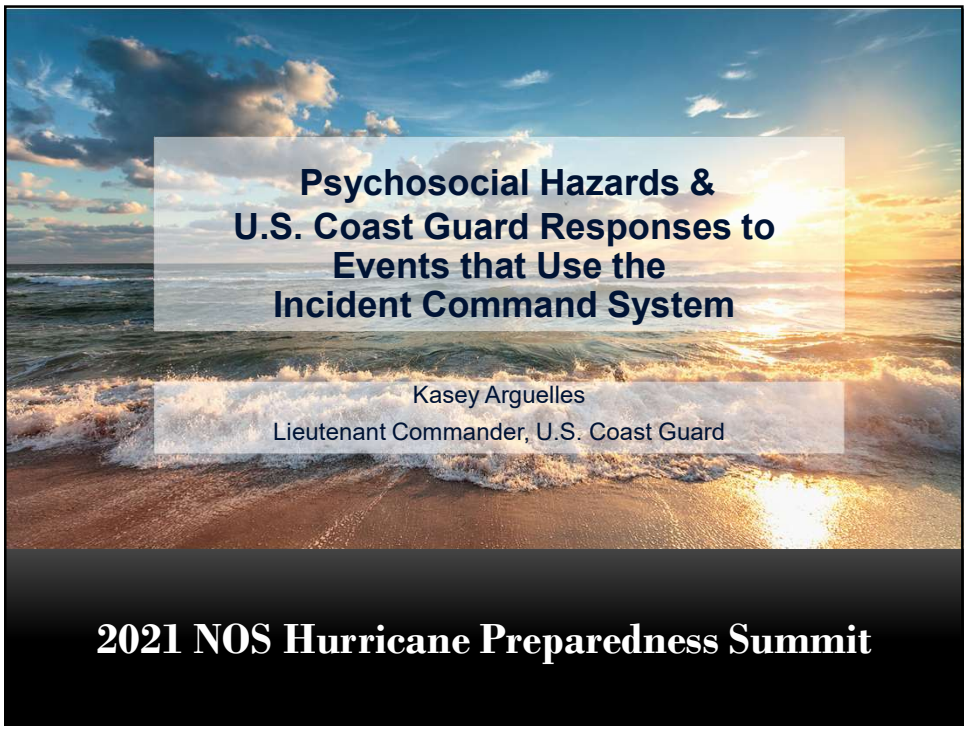
11


Questions and Answers
• The Way ahead…
• Any Questions?
"Do not become a statistic for someone else to use in their Safety Moment" - Ashmore

12


Thank You
Randy T. Ashmore
Gallagher Marine Systems LLC
www.gallaghermarine.com
RAShmore@chgms.com
856-505-0875

13


Psychosocial Hazards & U.S. Coast Guard Responses to Events that Use the Incident Command System
Kasey Arguelles
Lieutenant Commander, U.S. Coast Guard
2021 NOS Hurricane Preparedness Summit

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Research Goal

- Enhance the U.S. Coast Guard's Health & Safety Management System through a better understanding of member exposure to psychosocial hazards during responses using ICS.
- Research conducted Fall 2016. Released Spring 2017.


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2021 NOS Hurricane Preparedness Summit

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Objectives

- Identify the psychosocial hazards that USCG responders are exposed to during an ICS response and determine relationships between ICS/Response factors and psychosocial hazards.
- Collect recommendations to eliminate or mitigate USCG responder exposure to psychosocial hazards.
- Discuss controls specific to COVID-19 burn-out / stress and importance of Critical Incident Stress Response/

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Psychosocial Hazard List

1. Verbal conflict between members
2. Inadequate reward / recognition
3. Witnessed / experienced trauma
4. Poor communication
5. Little decision-making involvement
6. Mentally demanding work
7. Emotionally demanding work
8. Poor work-life balance
9. Overwhelmed / stressed by workload
10. Lack of supervision
11. Lack of emotional support
12. Lack of physical support
13. Lack of supervision
14. Lack of training
15. Isolated work
16. Night work
17. Inconsistent shift work

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ICS / Response Factors

1. Type of Response
2. ICS Section
3. Supervisor Role
4. Temporary Duty Orders Assignment
5. Work Location
6. Length of Average Workday

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Methods

Psychosocial Hazards & Factors Statistical Analysis

- Online Survey via SurveyMonkey
  - Response Rate: 12.3%
- EXPLORATORY STUDY
  - Cross-Tabulation Analysis
  - Caution with Chi-Square Test
- Interpretation of Data
  - ICS Experience & Knowledge

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Findings

Type of Response

Psychosocial Hazard	Hurricane (%) vs. Oil (%) vs. Plan (%)
Overwhelmed/Stressed by Workload	(31.2) vs. (19.2) vs. (15.4)



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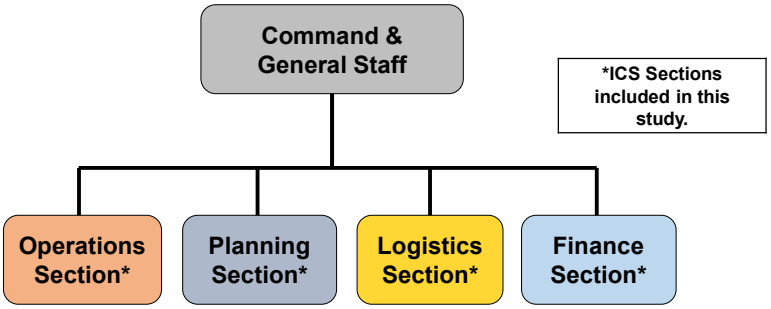

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Findings

ICS Section

Psychosocial Hazard	Operations (%) vs. Other Sections (%)
Witness/Experience Trauma	(23.7) vs. (8.5)



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Findings

Supervisor Role

Psychosocial Hazard	Supervisor (%) vs. Non-Supervisor(%)
Little Involvement in Decision-Making	(7.8) vs. (29.6)
Lack of Proper Training to Accomplish Job	(9.1) vs. (22.7)


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Findings

Temporary Duty Orders

Psychosocial Hazard	On Orders (%) vs. Not on Orders (%)
Lack of Proper Training to Accomplish Job	(6.9) vs. (21.0)

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Work Location

Incident Command Post (ICP)

Field

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Findings

Work Location

Psychosocial Hazard	Field (%) vs. ICP(%)
Lack of Supervision	(6.1) vs. (23.9)
Lack of Proper Training to Accomplish Job	(3.0) vs. (18.2)
Mentally Demanding Work	(37.5) vs. (61.0)
Overwhelmed/Stressed by Workload	(12.1) vs. (29.6)

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Findings

Average Length of Workday

Psychosocial Hazard	12 or Less (%) vs. 12 -16 (%) vs. 16 or More [p]
Verbal Conflict	(18.0) (34.6) (46.7) [0.0495]
Witness/Experience Trauma	(6.0) (13.0) (40.0) [0.0032]
Poor Communication	(18.4) (29.6) (53.3) [0.0286]
Mentally Demanding Work	(34.7) (61.1) (93.3) [0.0001]
Emotionally Demanding Work	(14.3) (34.6) (66.7) [0.0004]
Poor Work-Life Balance	(10.0) (25.9) (60.0) [0.0003]
Overwhelmed/Stressed by Workload	(6.0) (36.4) (40.0) [0.0004]

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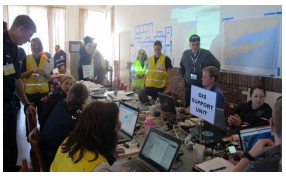
General Recommendations

- Survey Controls
  - Prioritize SOFR / ASOF Role
  - Promote Work-Life / CISM Resources
  - Enforce Work-Rest & Max Work Hours
  - Review IMT Span of Control & Assignment
  - Invest in ICS Qualifications & Experience

- Responder Direct Feedback
  - 360-Degree Feedback System
  - Incorporate ICS in Daily Work Practices
  - Prioritize Reward & Recognition
  - Complimentary Coffee Bar / Snack Area



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COVID-19 Controls

- Re-Frame New Normal
  - Recognize Burn-Out as Psychosocial
- Medical Unit Leader Assigned
- Assigned Team with Consistent Ro
  - Personal & Professional
  - Team Connection & Communication
- Mandatory Breaks & Rest
- Basic Needs Met
  - Plan for worst case

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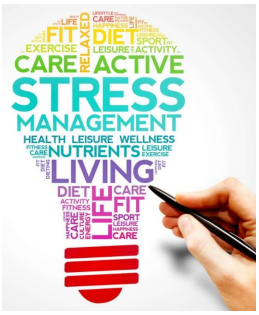
Critical Incident Stress Response

- COMDINST 1754.3A, Critical Incident Stress Management
- Psychological First Aid
  - NOT therapy
  - Identify signs / symptoms & provide support
  - Mitigate hazards from worker stress in crisis situations
- Critical Incident Response Team
- Pre-Incident Training of Peers
  - Critical Incident Peer Support
- Educate & Promote during Incident
  - ICS-204 Work Assignment
  - Tailgate Talks
  - Safety Message
  - Unified Command Priority and/or Assigned Incident Objective
- Demob Outbrief



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Acknowledgements

- University of Massachusetts-Lowell, Dept of Public Health
- USCG Health Safety & Worklife Service Center
- USCG Atlantic Strike Team
- USCG Sector LA/LB
- USCG Sector New Orleans
- USCG TRACEN Yorktown

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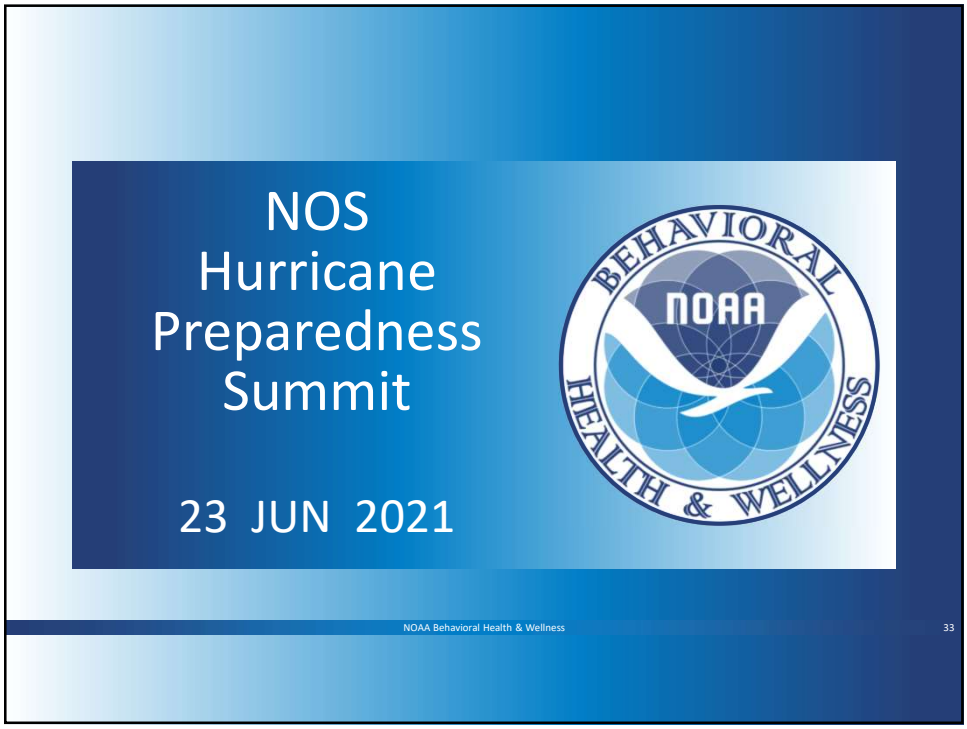
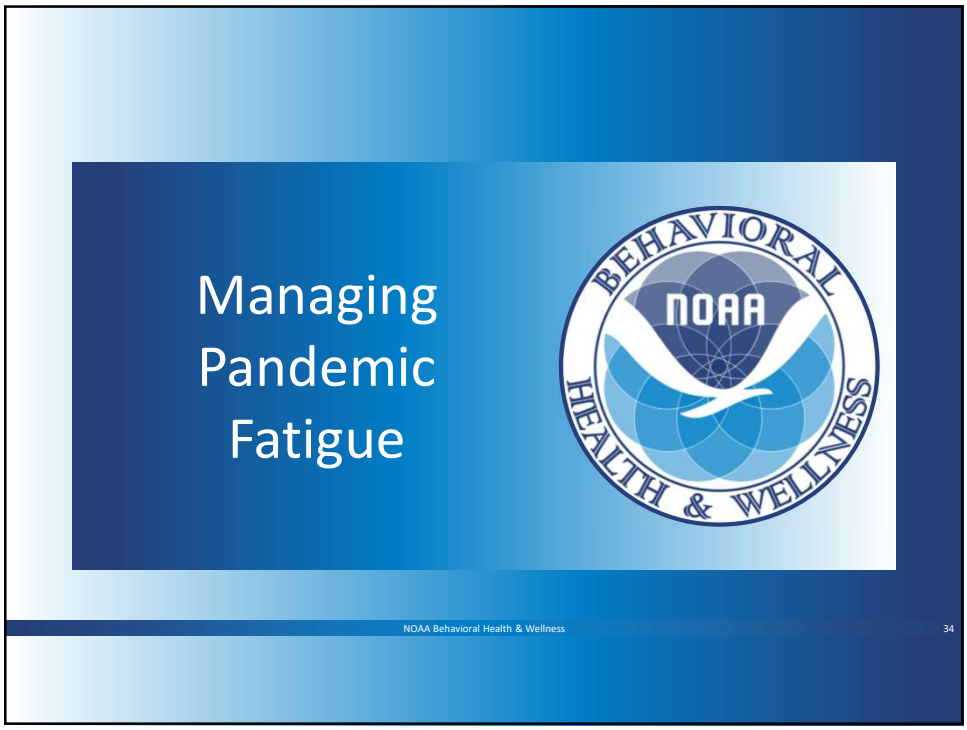

NOS
Hurricane
Preparedness
Summit
23 JUN 2021
NOAA
BEHAVIORAL
HEALTH & WELLNESS
NOAA Behavioral Health & Wellness
33

33


Managing
Pandemic
Fatigue
NOAA
BEHAVIORAL
HEALTH & WELLNESS
NOAA Behavioral Health & Wellness
34

34

Introduction

Name:

Kenneth J. "KJ" Green, LCSW, BCD
Commander, U.S. Public Health Service

Billet and Duty Station:

Director, Behavioral Health & Wellness
Office of Health Services, OMAO
Silver Spring, MD

Contact:

personal cell: 571-241-0349 (call or text)
kenneth.green@noaa.gov

NOAA Behavioral Health & Wellness 35

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Overview

This conversation will address the following questions:

Managing Pandemic Fatigue

1. Why are we talking about pandemic fatigue?
2. What is pandemic fatigue?
3. What are the behavioral health impacts of the pandemic?
4. How can we manage pandemic fatigue?
5. What does NOAA Behavioral Health and Wellness do?
6. How can we contact NOAA Behavioral Health and Wellness?

NOAA Behavioral Health & Wellness 36

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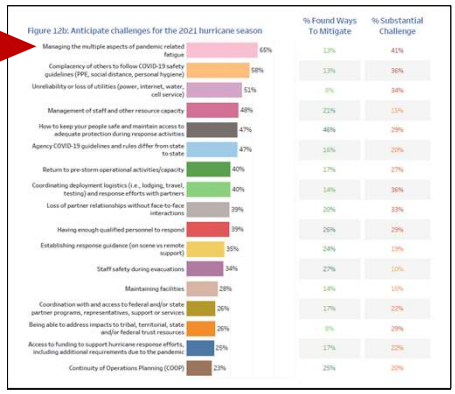
Source:
The Survey Center, University of New Hampshire

Managing Pandemic Fatigue

Q1. Why are we talking about Pandemic Fatigue?



You ranked this #1 of 17 anticipated challenges for the 2021 hurricane season

37

Source:
adapted from Cannon, W.B.

Managing Pandemic Fatigue

Q2. What is Pandemic Fatigue?

Pandemic-Related Fatigue is a result of Pandemic-Related Stress

Definitions:

Stress is a *fight-or-flight response* to a *perceived threat*.

A **fight-or-flight response** is a release of cortisol and adrenaline in the bloodstream.

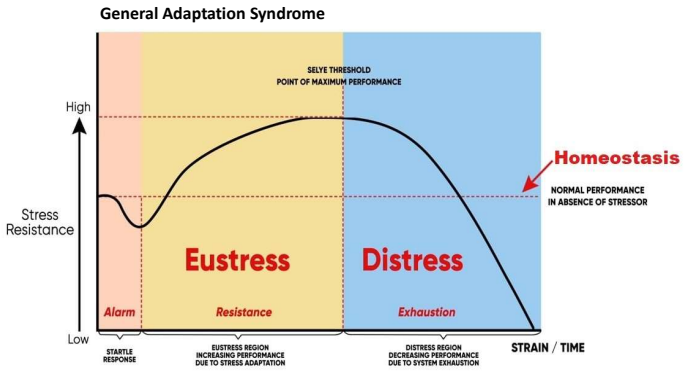
A **perceived threat** is anything that alarms the amygdala (e.g., change).

38

Source:
adapted from Selye, H.

Managing Pandemic Fatigue

Q2. What is Pandemic Fatigue?

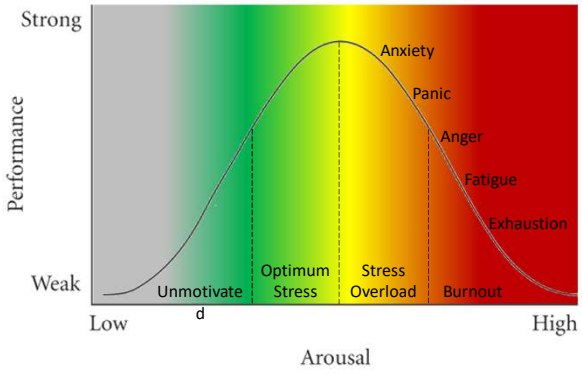


39

Source:
adapted from Yerkes, R.M., & Dodson, J.D.

Managing Pandemic Fatigue

Q2. What is Pandemic Fatigue?

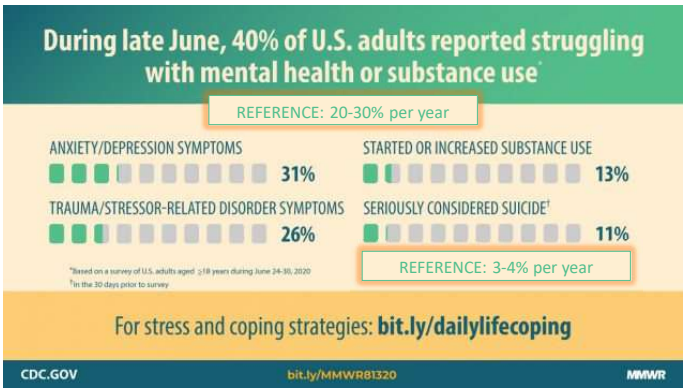


40

Source: CDC

Managing Pandemic Fatigue

Q3. What are the behavioral health impacts of the pandemic?



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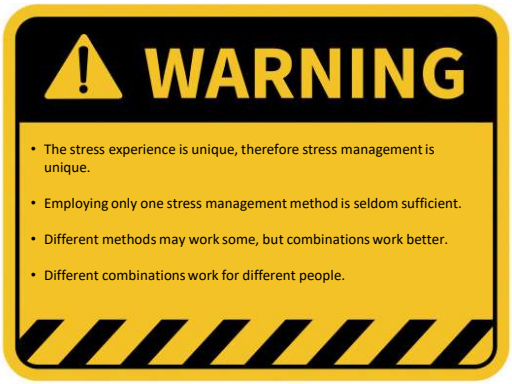
Managing Pandemic Fatigue

Q4. How can we manage Pandemic Fatigue?



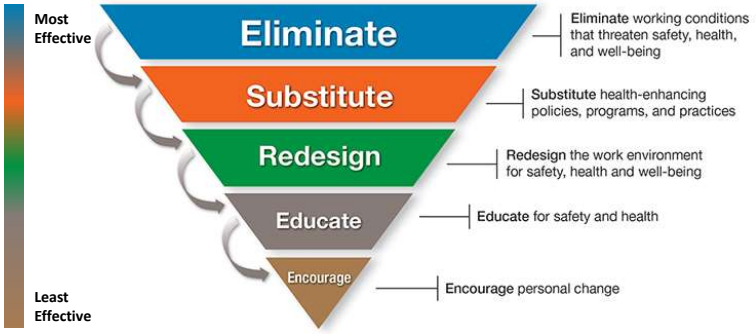
42

Source:
NIOSH, CDC

Managing Pandemic Fatigue

Q4. How can we manage Pandemic Fatigue?

Total Worker Health Hierarchy of Controls



43

Managing Pandemic Fatigue

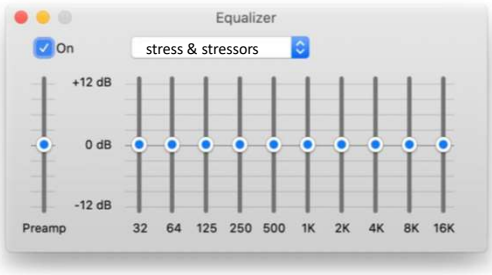
Q4. How can we manage Pandemic Fatigue?

Throttling Stress Exposure

Think like a clinician:

- Onset of first/original episode
- Frequency of episodes
- Intensity of episodes
- Duration of episodes

These variables are trade-offs.



*NOTE: Everyone's equalizer in unique to them.

44

Source:
adapted from VitalSmarts, LLC

Managing Pandemic Fatigue

Q4. How can we manage Pandemic Fatigue?

Sources of Influence

	MOTIVATION	ABILITY
PERSONAL	1 Do I identify with and believe in this behavior and what it will lead to?	2 Do I have the knowledge and skills necessary to conduct this behavior?
SOCIAL	3 Am I surrounded by people who support and encourage me in this behavior?	4 Do I have access to people who can help, guide, and mentor me with this behavior?
STRUCTURAL	5 Am I in an environment that reminds and incentivizes me to engage in this behavior?	6 Do I have access to the tools and resources necessary to conduct this behavior?

45

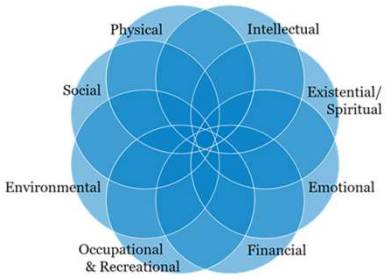
Managing Pandemic Fatigue

Q4. How can we manage Pandemic Fatigue?

Wellness: Personal Resilience

Wellness is an active process of examining options, making choices, and taking actions in the pursuit of living a better life through the optimal balance of—and synergistic relationship between—multiple overlapping and interconnected life domains.

- Intellectual: curiosity and engagement
- Existential/Spiritual: sense of purpose and meaning
- Emotional: affective balance and life satisfaction
- Financial: security, basic needs, and simple pleasures
- Occ & Rec: balance between satisfying work and leisure
- Environmental: safe and comfortable with access to resources
- Social: trust (honesty → safety) and respect (kindness → value)
- Physical: performance triad (diet, physical activity, sleep)



Source:
adapted from Substance Abuse and Mental Health Services Administration

46

Managing Pandemic Fatigue

Q5. What does NOAA Behavioral Health and Wellness do?

1. Direct Services on a Case-by-Case Basis
   - Consultation
   - Case Management
   - Clinical Care
2. Education & Training
   - Behavioral Health Literacy
   - Stress Management and Resilience
3. Programs
   - Peer Support Program
4. Policies, SOPs, etc.
5. Intranet Website https://sites.google.com/noaa.gov/behavioral-health-and-wellness
6. Suggestions / Recommendations?

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Managing Pandemic Fatigue

Q6. How can we contact NOAA Behavioral Health and Wellness?

Kenneth J. "KJ" Green, LCSW, BCD
Commander, U.S. Public Health Service
Director, Behavioral Health & Wellness
Office of Health Services
National Oceanic and Atmospheric Administration

cell: 571-241-0349 (call or text)
Email: kenneth.green@noaa.gov

Andrea Battle, PhD
Lieutenant Commander, U.S. Public Health Service
Behavioral Health & Wellness Officer
National Marine Fisheries Service
National Oceanic and Atmospheric Administration

cell: 301-325-1672 (call or text)
Email: andrea.battle@noaa.gov

Valarie Gardner, LCSW, MAC, BCD
Lieutenant Commander, U.S. Public Health Service
Behavioral Health & Wellness Officer
National Weather Service
National Oceanic and Atmospheric Administration

cell: 202-510-0362 (call or text)
Email: valarie.gardner@noaa.gov

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Thank You!
NOAA Behavioral Health & Wellness
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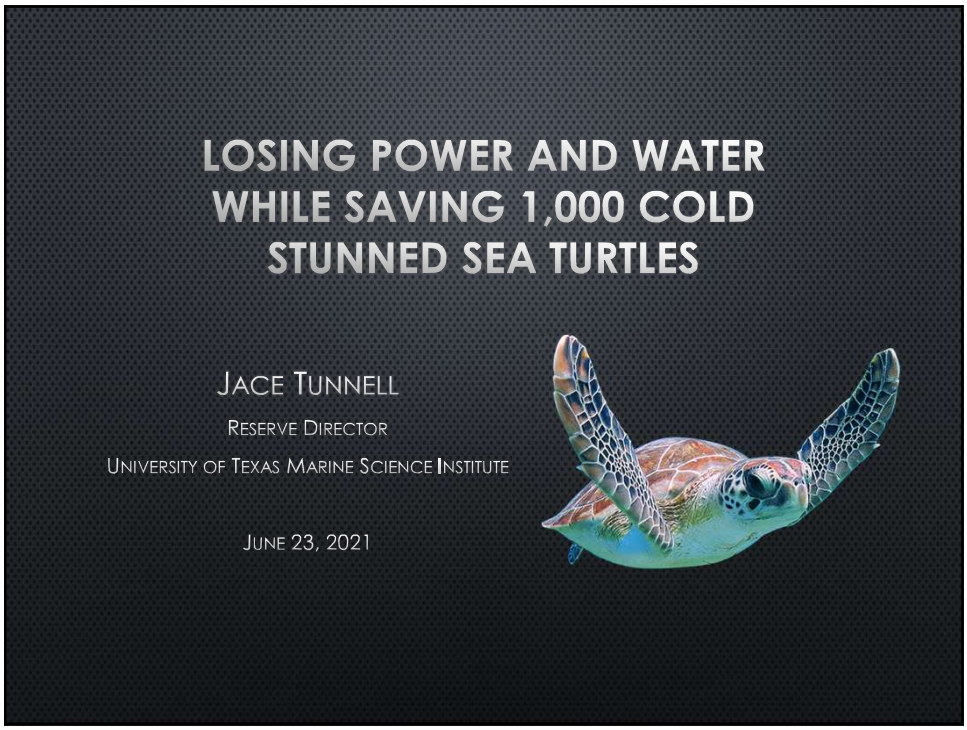
LOSING POWER AND WATER WHILE SAVING 1,000 COLD STUNNED SEA TURTLES
JACE TUNNELL
RESERVE DIRECTOR
UNIVERSITY OF TEXAS MARINE SCIENCE INSTITUTE
JUNE 23, 2021

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51


Estimated Snowfall Feb. 13-16, 2021
Lighter
Heavier
Burlington
Chicago
Cleveland
New York
Kansas City
Washington
Louisville
Oklahoma City
Amarillo
Memphis
Birmingham
Dallas
New Orleans
Houston
University of Texas Marine Science Institute

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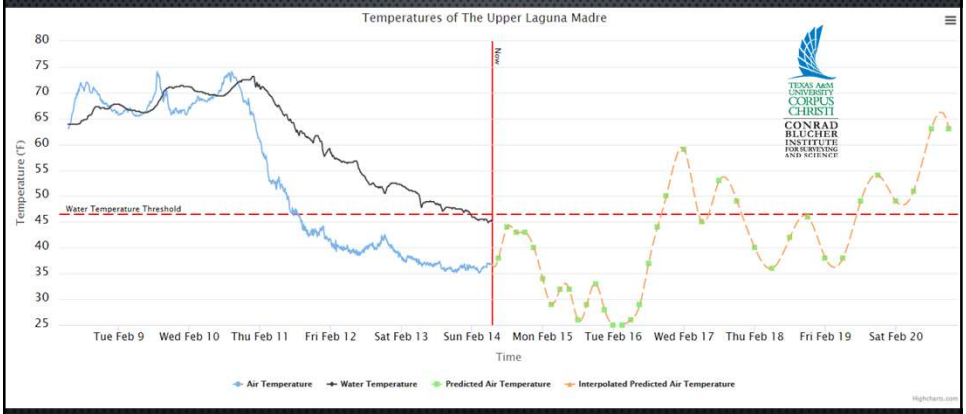
MONITORING TEMPERATURES



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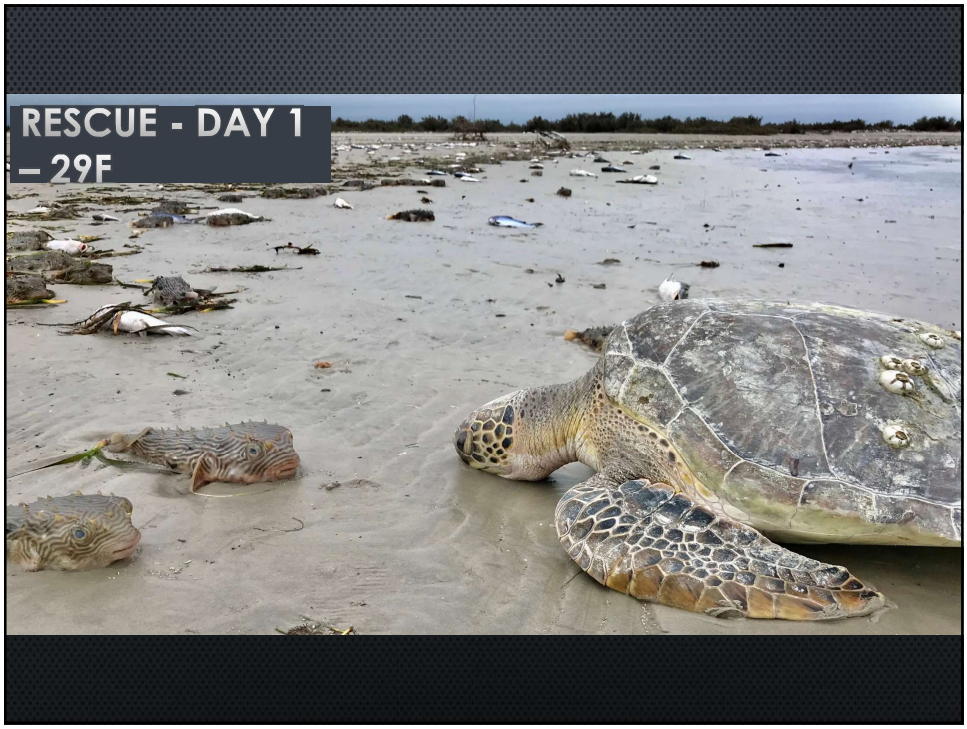
IMPACTS

- Mass Strandings
- Drowning
- Predation
  - Coyotes
  - Vultures
  - Fire ants
- Boat strikes
- Freezing to death

54



55

POWER OUTAGE

- All of Port Aransas power out for 24 hours
- No freshwater due to broken pipes
- University closed for the week
- Two portable generators used for heat rooms

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EXPANDED TO AUDITORIUM

57

DR. SHAVER STATE WIDE STATS

- 13,418 sea turtles stranded in Texas
- 3,702 previous Texas record set in 2017-2018
- 4,613 previous U.S. record set in Florida in 2010
- Records being kept on cold stunning since 1980
- 4,368 sea turtles rescued alive, rehabbed, and released to Gulf of Mexico (4,253 greens and 3 loggerheads).
- The ARK still has 5 sea turtles for more medical attention

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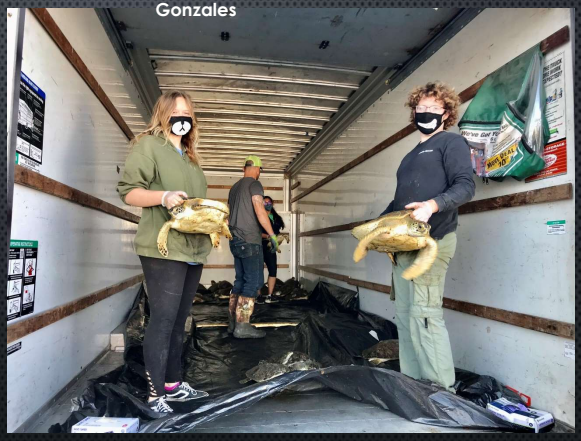
ARK EFFORTS

- 1,000 live sea turtles, 300 dead
- 10 days of intake
- All greens except for 1 loggerhead
- 10 turtles kept for more treatment

Andrew Orgill and Rylee Gonzales



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FUTURE EVENTS

- PORTABLE GENERATOR
- PORTABLE WATER TANK

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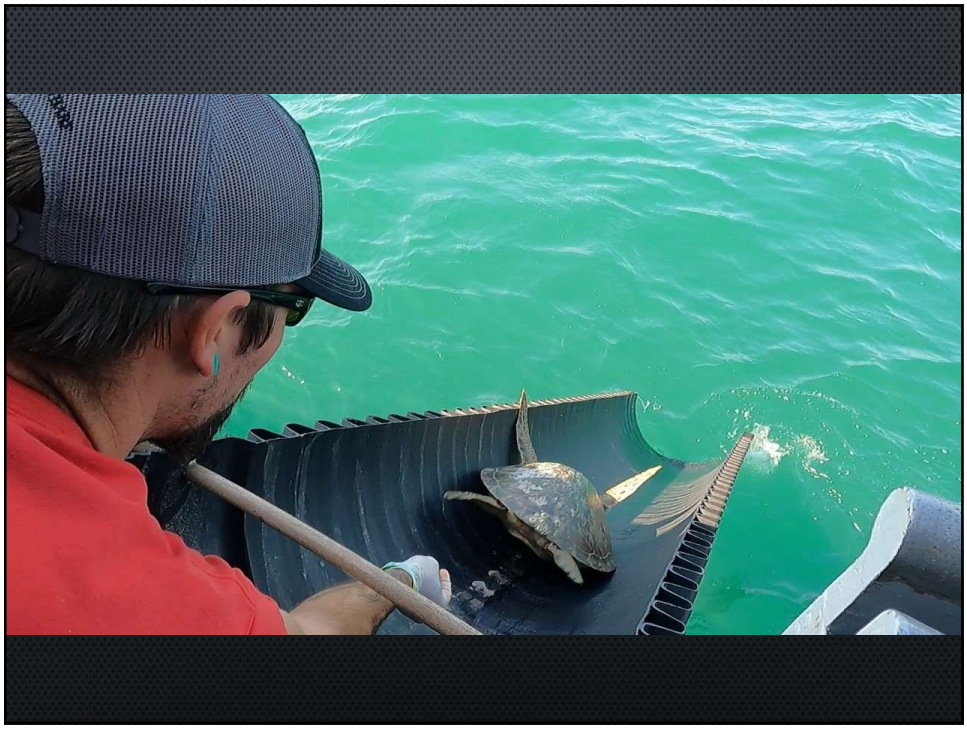

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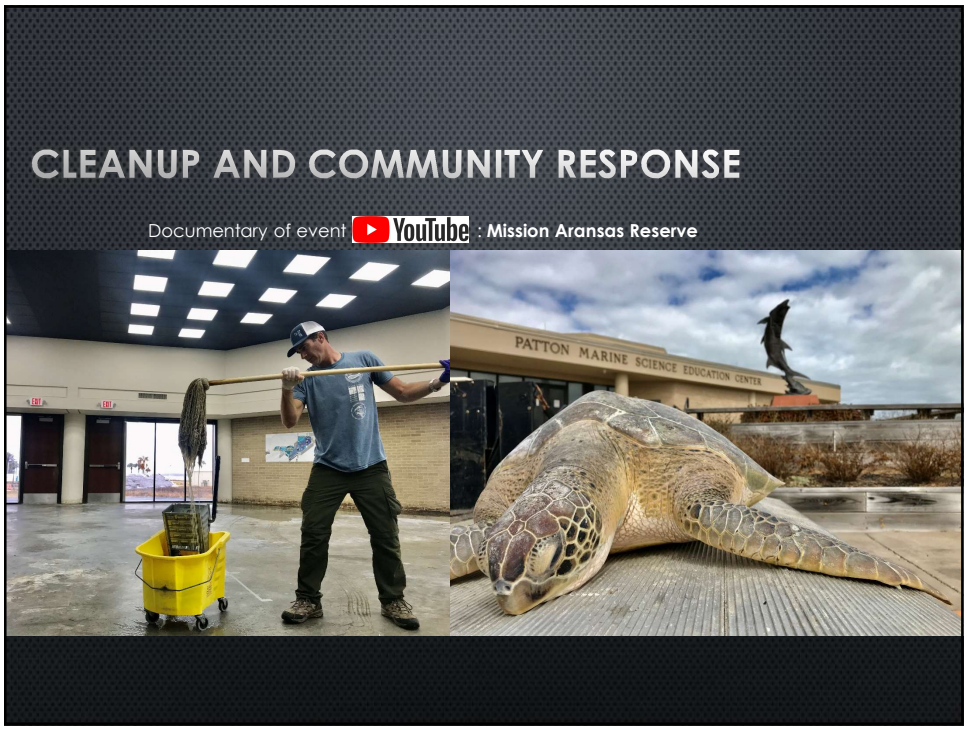
CLEANUP AND COMMUNITY RESPONSE
Documentary of event YouTube : Mission Aransas Reserve
PATTON MARINE SCIENCE EDUCATION CENTER

62


THANK YOU!
jace@utexas.edu

63


2020/202
A year for lessons learned
Jeffry Evans
Meteorologist in Charge
NWS Houston/Galveston
NATIONAL WEATHER SERVICE
Protecting Lives and Property for 150 Years
NWS HOUSTON-GALVESTON
www.weather.gov
Michael Ciaglo/AP

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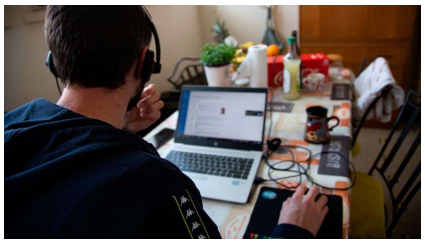
COVID

- Culture evolution at a record pace
- Flexibility and ingenuity
- People and Mission first



NATIONAL WEATHER SERVICE
Protecting Lives and Property for 150 Years
NWS HOUSTON-GALVESTON
www.weather.gov/Houston @NWSHouston

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Record hurricane season

- Record year for Atlantic, and especially for Gulf.
- Combination of COVID and tropical Operational and Decision support from home.
- Shared backup.

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NWS HOUSTON-GALVESTON
www.weather.gov/Houston @NWSHouston

66

Winter apocalypse

- Treated as a hurricane/tropical event for coastal offices.
- Coastal offices bedding, supplies, plans for extended stay.
- COVID as bad as ever.
  No 'on-sight' support
- Plan for the unexpected….

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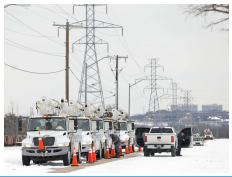
Winter apocalypse

Expected: Travel, food, gasoline, rolling power outages
Unexpected: Complete loss of power for days, generators failing, water/plumbing outages, cell phone outages, salt, 'telework' without basic necessities/damaged homes



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NWS HOUSTON-GALVESTON
www.weather.gov/Houston @NWSHouston

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Winter apocalypse

- Backup plans- BRO went down hard, SJU backed up SJT needed backup from MAF (who then had to hand off to LBB)
- SJT, SHV (and a few others) had no running water. *Melted snow for flushing toilets. No showers.*
- Staff stuck in the office for days with no running water. Some able to get hotels ahead of it.
- Sidewalk salt/snow removal not available.
- Nearly all offices had staff in telework status with no way to 'work', some dealing with damage.

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Some takeaways

- Flexibility and communication are keys.
  - No one used NOAA ENS
- Support people and mission will follow.
- People are resilient, but for only so long.
- Understand the next 'ordeal' will bring new challenges!

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"The Perfect Response"

Hurricane Preparedness Summit

LCDR Megan R. Guberski, NOAA
Office of Coast Survey
Navigation Response Branch
June 23, 2021

Office of Coast Survey
National Oceanic and Atmospheric Administration

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Coast Survey

The Perfect Response

- What would be the perfect response to a Hurricane?
- Each storm is unique and brings its own challenges
- There really isn't a perfect response
- But that is OK

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But if we could have a perfect response?

- What would it look like?
- Different postures for different types of storms?
  - Minor Hurricane
    - CAT 1 and 2
    - NRT's will not preposition
  - Major Hurricane
    - CAT3 and above
    - Depending on the storm track NRT's may preposition

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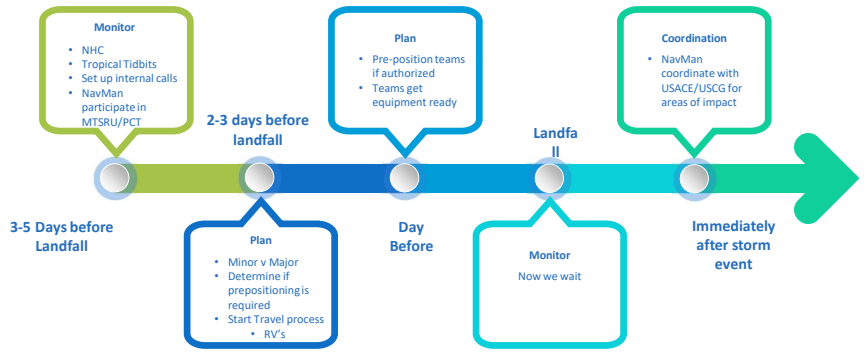
Perfect Response Timeline



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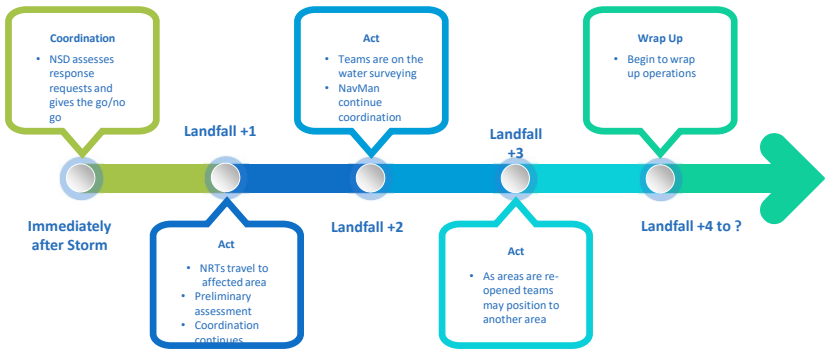
Perfect Response Timeline



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Response in the time of COVID-19

- Re-integration protocols still apply
  - Testing
  - Masking
  - 2 people boat crews (unless three are required for safety reasons)
- OCS Director must sign off on response activities

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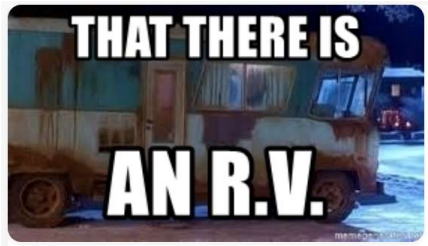
Lesson's Learned from 2020



- RV's are a good thing (still not buying one)
- Separate team for overnight processing
  - Especially for major response
- Google Sheet for response coordination

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The Perfect Response

- There is no such thing
- Need to be Flexible
- Need to be Adaptable
- Every Situation is different

Murphy's Law

Anything that can go wrong...
will go wrong.

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The Perfect Response (maybe)

- 2020 – Hurricane Zeta – CAT 2
- October 28, 2020 – Landfall
- October 29, 2020 (morning)
  - Request received for Gulfport, MS
- October 29, 2020 (afternoon)
  - NRT – Stennis on the water and completed survey
- We got lucky
  - In our backyard

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Logistics for Station Repairs Following Tropical Cyclones

Paul Fanelli
Lead Oceanographer
National Ocean Service (NOS)
Center for Operational Oceanographic Products & Services (CO-OPS)

paul.fanelli@noaa.gov

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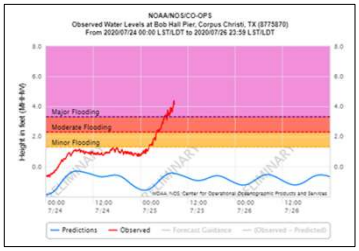
CO-OPS Water Level Information

- Critical for navigation & coastal flood/storm surge monitoring
- Maintaining station uptime, especially during an active hurricane season is ***crucial***



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Real-Time Station Monitoring

CO-OPS Continuously Operational Real-time Monitoring System (CORMS)

- Operational 24 / 7 / 365
- Watchstanders monitor data quality at all CO-OPS stations
- Send out email alerts when data is missing for 4 hours
  - Again at 24 hours
- Switch data dissemination to backup sensors if available
  - Stop dissemination at stations where no good data is available.

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Is a Station Visit Needed?

- CO-OPS personnel have the ability to remotely access and troubleshoot issues at stations
  - Run diagnostics
  - Reboot systems
  - Reduce power consumption
- If all else fails, we will reach out to local groups/individuals or Federal partners (OCS, USGS) who may be in the area to check the site and take pictures if possible
- Station issues tracked internally using Atlassian Jira tool
  - Allows easy coordination between CO-OPS' divisions

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Post-Hurricane Traveling

- Aim is to access station as quickly as possible (but not interfere with first responders)
  - Need to ensure that area is safe to visit
- Could take 2 weeks to get out to a station for repairs
- In most cases, travel-time to a station is not a factor, but crew may visit additional stations *on the way*
- Due to COVID-19 travel reductions, field crews may bring all necessary equipment to rebuild station from scratch.
  - Has not been feasible to make a separate visit ahead of time to assessing stations
  - Reliance on any site photos / information we can get

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Lodging

- Can be a challenge, especially in hard-hit areas
- During Irma, field crew slept in hammocks at a boy scout camp in the Florida Keys
- Following Laura, crew needed to commute 3 - 4 hours to and from a station for multiple days while station was rebuilt
  - Communication with other offices (USGS, OCS) and local points of contact mutually helps crews find places to stay

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Freshwater Canal Locks, LA

Before Hurricane Laura

After Hurricane Laura

Before Hurricane Delta

- Destroyed during Hurricane Laura
- Repairs delayed due to Hurricane Sally & Tropical Storm Beta
- Installed in time to capture water levels from Hurricane Delta

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2021 Hurricane Season

- Forecasts indicate another busy hurricane season.
- CO-OPS will continue to issue storm QuickLooks highlighting water levels for tropical cyclones
- Real-time coastal flooding information is always available through the Coastal Inundation Dashboard
  - https://tidesandcurrents.noaa.gov/inundationdb/
  - New ***Multi-Station View*** feature allows you to see water level data for up to 20 stations on a single page!
- CO-OPS field crews in Chesapeake, VA, Gulf Breeze, FL & Seattle, WA continue mission critical station visits
  - Ready to perform emergency maintenance when the next storm hits.

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Doug Helton

Acting Regional Operations Branch Chief
NOAA OR&R Emergency Response Division (ERD)

June 23, 2021

National Ocean Service

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Hurricane SALLY

2020 SUMMARY

- TS CRISTOBAL, June 1-9, Landfall SE LA, $665 million Damage Cost
- Hurricane LAURA, Cat 4, Aug 20-29, Landfall Cameron LA, $19.1 billion Damage Cost
- Hurricane MARCO, Cat 1, Aug 20-25, Landfall SE LA, $35 million Damage Cost
- **Hurricane SALLY, Cat 2, Sep 10-29, Landfall Gulf Shores, $7.3 billion Damage Cost**
- Hurricane DELTA, 5-10 October, Cat 4, Creole, LA, $4.19 billion Damage Cost
- **Hurricane ZETA, Cat 2, Oct 24-29, Landfall Cocodrie LA, $3.8 billion Damage Cost**
- Hurricane ETA, Cat 4, 31 Oct – Nov 13, Landfall Florida Keys, $7.9 billion Damage Cost

- NOAA DRC was dedicated in 2012.
- Sector Mobile and the DRC signed an official MOA 2 July 2014.
- Annual Exercise of COOP and Hurricane Plan since 2014.
- 2020 Established 1st IMT for Sector Mobile incident response & LANT IMAT 1st deployed ISO SALLY MER.
- Sector & LANT IMATs occupied DRC for approximately 30 days, 70 CG personnel onboard

COOP to NOAA DRC

- 15 – 25 Sep, Hurricane Sally, 48 responders
- 03 – 23 Oct, Sally MER Response, 133 responders

Accomplishments:

- 12 Type-3 ICS Board & Certification for seven personnel

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Government Incident Management Tools

Jonathan Gordon - IT & Facilities - Office of National Marine Sanctuaries

Identifying collaboration tools used by partner organizations during Incidents and how to access them through NOAA.

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Standard Collaboration Suites

Collaboration Tools:

1. Zoom for Government
2. Google Suite
3. Microsoft Teams
4. LogMeIn
5. Webex
6. Adobe Connect
7. Internally Generated Technology

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Standard Collaboration Suites

Product	Online Meetings	Mobile Client/ Apps	File Collaboration	Web-Based Dashboard
Google Suite	YES	YES	YES	YES
Microsoft Teams	YES	YES	YES	YES
Zoom for Government	YES	YES	NO	NO
LogMeIn	YES	YES	NO	NO
WebEx	YES	YES	NO	NO
Adobe Connect	YES	YES	NO	NO

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External Incident Partners

- FEMA / DHS
- Coast Guard
- State Emergency Management

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Requesting Access - Who needs to approve?

- External collaboration tools are considered Non-Standard Software by NOAA and must be approved by the NOAA CIO
- Software requests should be routed through the following staff:
  - Office IT Manager / Office ISSO
  - Line Office ACIO
  - NOAA CIO

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NOAA Internal Tools

Collaboration / Common Operational Picture Tools:

1. Google Suite
2. Internally Generated Technology
   a. ERMA - Environmental Response Management App.
   b. NOS Disaster Coordination Dashboard
   c. ORR Response Link
   d. ONMS Incident Management Dashboard

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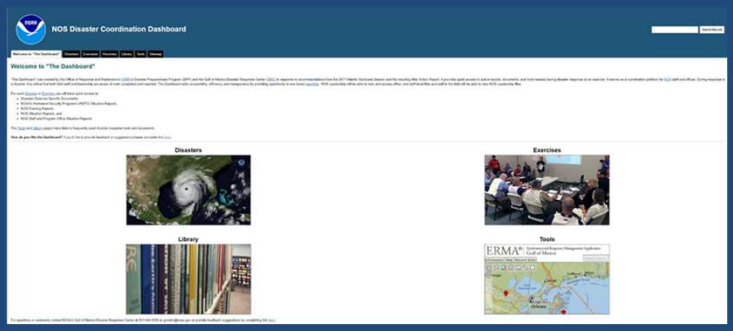
NOS Tools - NOS Disaster Coordination Dashboard



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NOS Tools - ERMA

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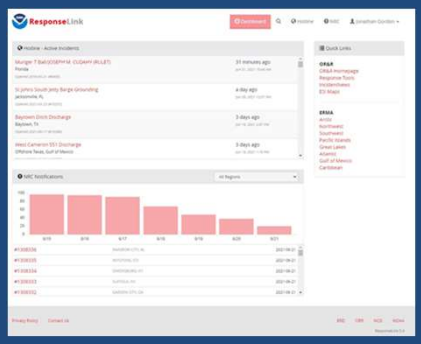
NOS Tools - ORR Response Link



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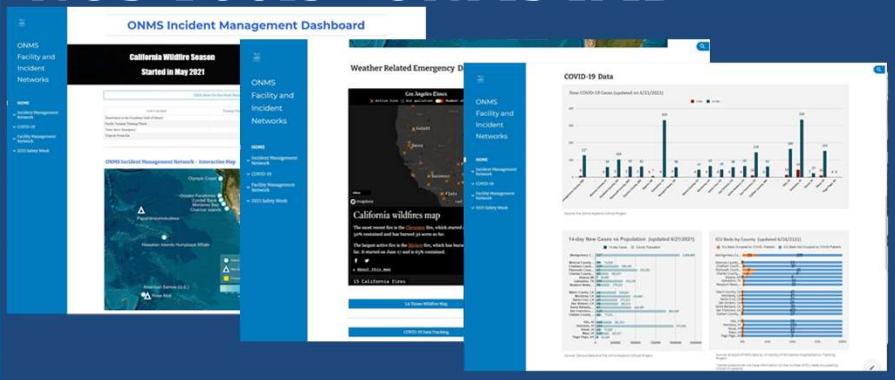
NOS Tools - ONMS IMD



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NOAA | Office of Response and Restoration
Disaster Preparedness Program
Kate Wheelock
Chief, NOS Disaster Preparedness Program
June 23, 2021

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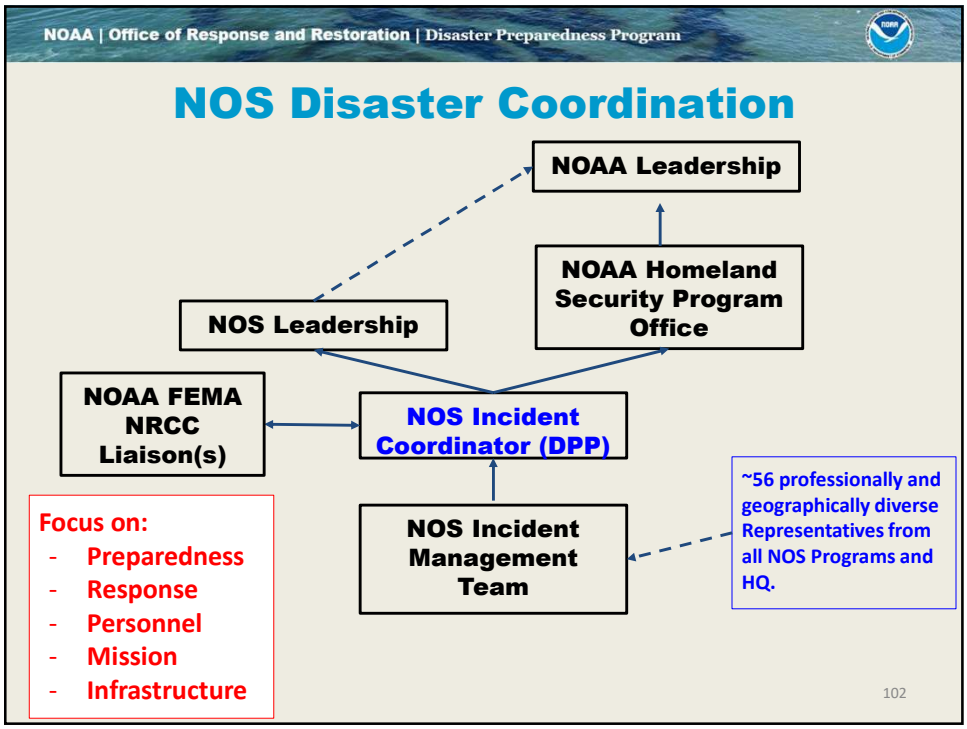
NOAA | Office of Response and Restoration | Disaster Preparedness Program
NOS Disaster Coordination
NOAA Leadership
NOAA Homeland Security Program Office
NOS Leadership
NOAA FEMA NRCC Liaison(s)
NOS Incident Coordinator (DPP)
NOS Incident Management Team
~56 professionally and geographically diverse Representatives from all NOS Programs and HQ.
Focus on:
- Preparedness
- Response
- Personnel
- Mission
- Infrastructure
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NOAA | Office of Response and Restoration | Disaster Preparedness Program

NOS IMT Lessons Learned

- The NOS Disaster Coordination Dashboard allows for remote situational awareness and event coordination.
- The structure and processes of the NOS Incident Management Team allowed for a smooth transition to remote reporting.
- There is a need to examine Continuity of Operations Plans across the organization and evaluate the need for physical COOP locations (and the infrastructure to support it).
- Continued remote work and COOP procedures will require consideration of enhanced internet and power solutions for individuals' homes/remote work locations.

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Melton 'Mel' Gaspard

Section Chief, Operations
Emergency Management Division, Louisiana's Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP)

June 23, 2021

National Ocean Service

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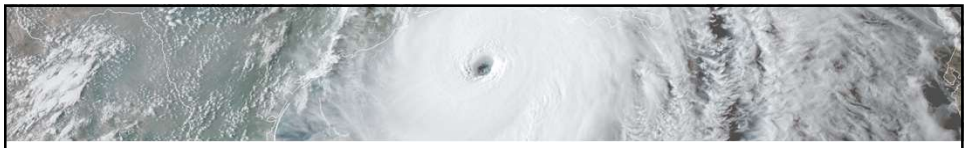

Chief James “Nick” Russo

Senior Type-1 Supervisor Field Leader Cadre
Federal Emergency Management Agency (FEMA)

June 23, 2021

National Ocean Service

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Homeland Security Program Office Overview

CAPT Anne Lynch, NOAA
Director, HSPO

NOS Hurricane Summit
June 23, 2021

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Agenda

- What is HSPO?
- Roles and Responsibilities
- Staff Assignments and Responsibilities
- NOAA OPS Center
- Activations
- HSPO Relationship With SMTs
- Common OPS Center Tools
- Looking Ahead

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Background

- Established shortly after September 11 attacks
- Serves as the principle point of contact for NOAA Executive Management regarding homeland security activities across the Administration
- Established the NOAA OPS Center to facilitate seamless integration for NOAA during an incident as required by the National Response Framework

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NOAA All-Hazards CONOPS

NAO 210-100 establishes requirements, policies, responsibilities, and authorities for the development, implementation, and oversight of the National Oceanic and Atmospheric Administration's (NOAA) All Hazards Incident Management effort through the NOAA All Hazards Incident Management Concept of Operations (CONOPS).

Primary Mission:

- Assist Leadership in maintaining the organization's PMEFs and MEFs
- Provide information which is timely, accurate and actionable
- Serve as the Department of Commerce Emergency Operations Center Liaison

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HSPO Responsibilities

- Manage the NOAA Operations Center to support the NOAA All-Hazards ConOps
- Coordinate NOAA wide response and preparation for incidents
- Oversee the NOAA COOP program to include: planning, training and exercising
- Provide emergency information to DOC EOC
- Conduct NOAA MEF & Critical Infrastructure (CI) Analyses
- Maintain validated NOAA Mission Essential Functions and NOAA CI
- HSPO also maintains a Quick Reference Document for COOP and Incident Coordination with up-to-date contact information for all Essential Mission Function

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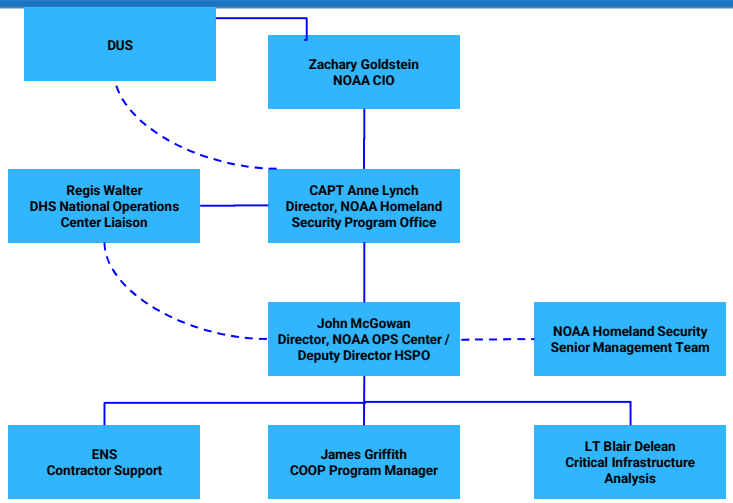
HSPO Organization



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NOAA Operations Center (responsibilities)

The responsibilities of the NOAA Operations Center include providing:

- A focal point for headquarters-level strategic coordination.
- Recommendations to DUS/NOAA Administrator on actions to take.
- Recommended priorities to DUS/NOAA Administrator for the use of resources in support of incident management.
- General oversight of the application of NOAA resources in coordination with existing agency and interagency resource management.
- Strategic situational awareness and decision support across the full spectrum of incident management domains, to include awareness, prevention, protection, response, and recovery.

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NOAA Operations Center (incident support)

Standard NOAA Operations Center incident management activities:

- Maintain situational awareness
- Integrate data for daily CIO briefs
- Coordinate and issue SITREPs
- Develop and daily briefs (during activations)
- Ensure coordination between Line/Staff Offices
- Coordinate with other federal agencies as needed
  - Watch stander at the DHS National Operations Center
  - Liaison to NORTHCOM & PACOM
  - Liaison to FEMA
  - Liaison to USCG
  - Liaison to Navy
- Support for regional areas (non NOAA Wide incidents):
  - Conduit to leadership
  - Coordinate "One-NOAA" response
  - Allows on scene folks to deal with issues there, providing support remotely

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NOAA OPS Center Activation Levels and Reporting Battle Rhythm

Activation Levels:

- 4: Routine / Normal OPS
- 3: Enhanced Routine
- 2: Partial Activation
- 1: Full Activation

Battle Rhythm:

- Have coordination call with SMTs when event unfolds
- Reporting generally starts at Level 3 - ad hoc only, scheduled reporting at Level 2
- Report impacts/unresolved issues/plan
- Input due (usually) 1000 and 1600
- Leadership update published 1200 ET
- SITREP generally published 1800 ET

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SMT Roles and Responsibilities

- Act as the liaison between HSPO and LO/SO
  - data calls, PMI input, etc
- Keep respective LO/SO informed, to include AA/DAA and other Program Managers as required, on HSPO matters
- Attend (monthly) SMT meetings as LO/SO SME
- Provide organizational leadership for developing, maintaining and carrying out both the NOAA Headquarters and their respective organization's Continuity of Operations Plan (COOP) and associated plans, the CONOPS, and functions, plans, programs and alert/notification operations for these programs.
- Coordinate with Line/Staff office ACIO as needed for MEF system Revalidation and for impacts to systems

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Ops Center Tools

- The NOAA Emergency Notification System (NOAA ENS) is the primary tool to notify staff on an all-hazards event, and to reach out to them after an all-hazards event.
- ERMA is Web-based mapping tool providing centralized access to information to increase communication, and coordination, to help us prepare for, respond to, assess impacts from an all-hazards incident or conditions
- Essential Records Server (ERS)
- Google Shared Drive / HSPO Google Site
  - improvements and use throughout pandemic

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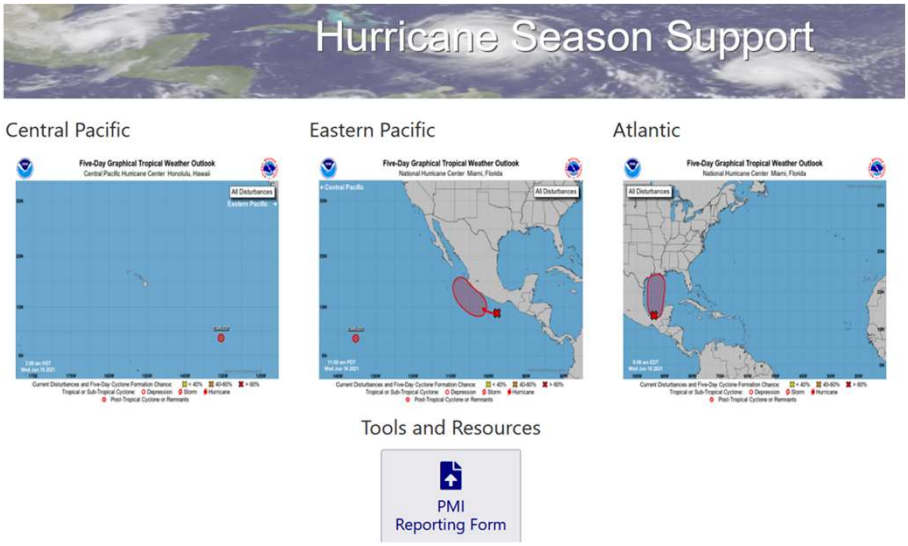
HSPO Website



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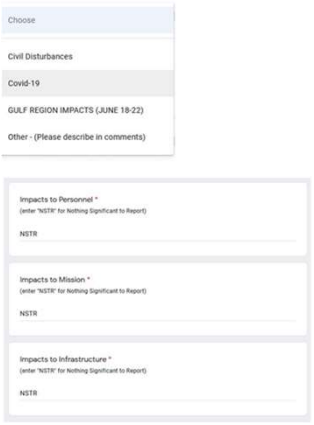
PMI Reporting Tool

- One form for all incidents instead of a new form for every incident
- Incident selection from those tracked by HSPO
- Prefilled for faster completion when there is nothing significant to report



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Looking Ahead

- Emergency Management
- Preparation is key!
- Positive attitude helps too!
- Support and Coordination
- Partnerships
- New Director - CAPT Chris Sloan, NOAA
  - currently serving as Commanding Officer, Aircraft Operations Center
  - Reports mid-late December

QUESTIONS?

THANK YOU!

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Wrap Up

Charlie Henry
Director, Gulf of Mexico Disaster Response Center (DRC)
NOAA OR&R

National Ocean Service

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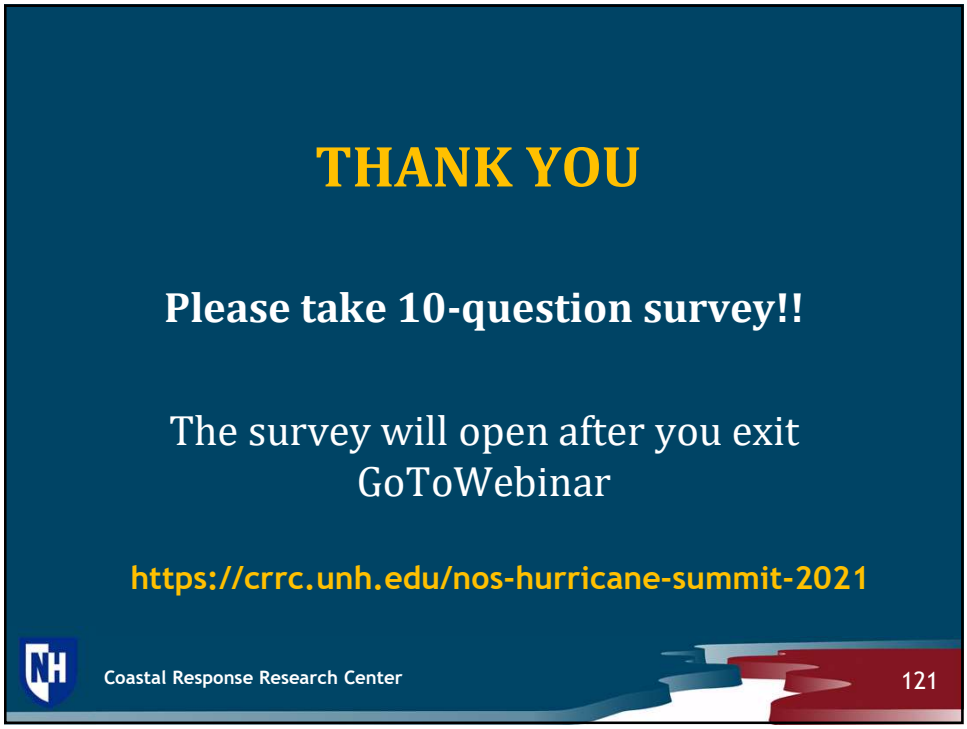
THANK YOU
Please take 10-question survey!!
The survey will open after you exit GoToWebinar
https://crrc.unh.edu/nos-hurricane-summit-2021
Coastal Response Research Center
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APPENDIX C
Pre-Summit Survey Technical Report

University of New Hampshire

The Survey Center

UNH Coastal Response Research Center
2021 Hurricane Pre-Summit Survey

Prepared by:

Zachary S. Azem, M.A.
Sean P. McKinley, M.A.
Tracy A. Keirns, Ph.D.

The Survey Center
University of New Hampshire
April, 2021

The University of New Hampshire
Survey Center

The UNH Survey Center is an independent, non-partisan academic survey research organization and division of the UNH College of Liberal Arts.

The Survey Center conducts telephone, mail, web, and intercept surveys, as well as focus groups and other qualitative research for university researchers, government agencies, public non-profit organizations, private businesses and media clients.

Our senior staff have over 50 years experience in designing and conducting custom research on a broad range of political, social, health care, and other public policy issues.

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Table of Contents

Executive Summary

The University of New Hampshire Survey Center conducted a survey for the University of New Hampshire Coastal Response Research Center to better understand the hurricane response, preparedness, and recovery community. One hundred and thirty-five (135) respondents completed the survey between April 7 and April 15, 2021. The following figures display survey results including any demographic differences. Appendix A contains detailed tabular results, Appendix B contains open-ended responses, and Appendix C contains the survey instrument. Due to rounding, percentages may not sum to 100%.

Key Findings

Demographics

The majority of respondents say that their agency or organization is the National Oceanic and Atmospheric Administration (NOAA) and the majority of respondents who work for or are a contractor for NOAA say that their line office is the National Ocean Service (NOS). Respondents are scattered in the various regions they represent with the most respondents saying that they represent the nation or the Gulf of Mexico.

Hurricane Preparedness & Response

About four in five respondents say their organization or agency has a hurricane preparedness or response plan and among those who have such a plan four in five say it includes provisions regarding the COVID-19 pandemic. Just under half of respondents say that differences between local, state, and federal guidelines created challenges for a timely and effective response in 2020.

Respondents were most likely to use the best practices of minimizing onscene personnel, temporarily halting routine field operations, enhancing communication protocols, and updating response methods during the 2020 hurricane season. A similar amount of respondents intend to use the same best practices in the 2021 hurricane season, aside from temporarily halting routine field operations, which a considerably lower amount of respondents plan to do in 2021.

About half of respondents say they know how to work through FEMA to get access to NOAA and other federal agency expertise while just under half say that they have a Mission Essential Function (MEF) or Emergency Support Function (ESF) role in hurricane response. Among those who have such a role in hurricane response, more than half of respondents work under ESF #10: Oil and Hazardous Materials Response while four in ten work under ESF #3: Public Works and Engineering.

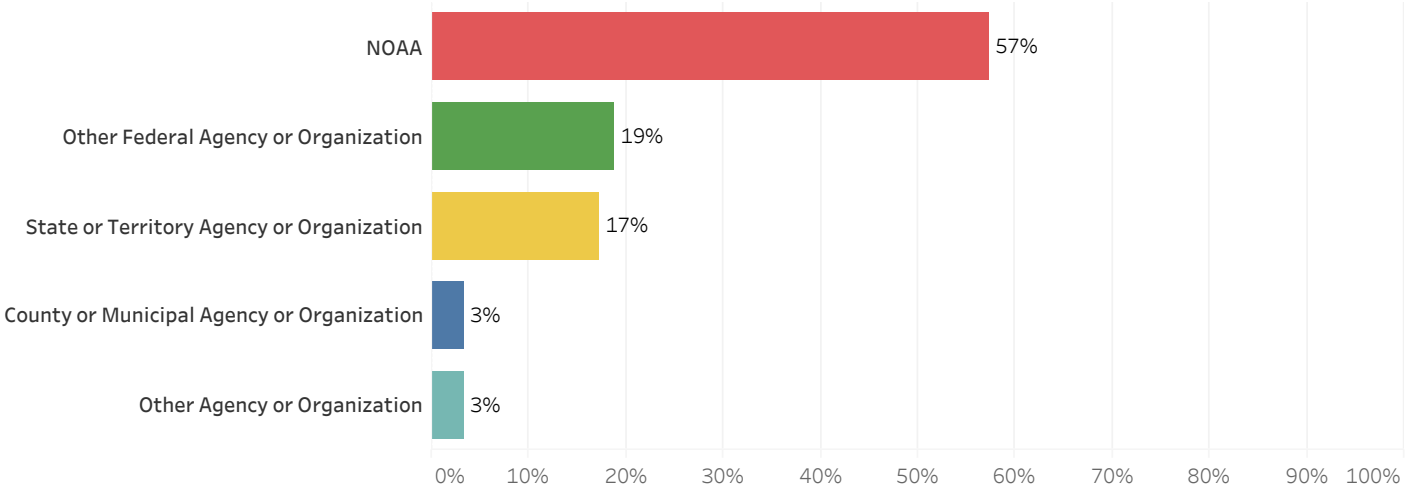
Challenges

A majority of respondents consider managing the multiple aspects of pandemic related fatigue, complacency of others to follow COVID-19 safety guidelines, and unreliability or loss of utilities as challenges for the 2021 hurricane season. Respondents are most likely to cite how to keep their people safe and maintain access to adequate protection during response activities, staff safety during evacuations, having enough qualified personnel to respond, and continuity of operations planning as challenges they have found ways to mitigate. Among those who cite particular things as challenges, nine in ten or more cited how to keep their people safe and maintain access to adequate protection during response activities, managing the multiple aspects of pandemic related fatigue, and continuity of operations planning as substantial or moderate challenges.

Demographics

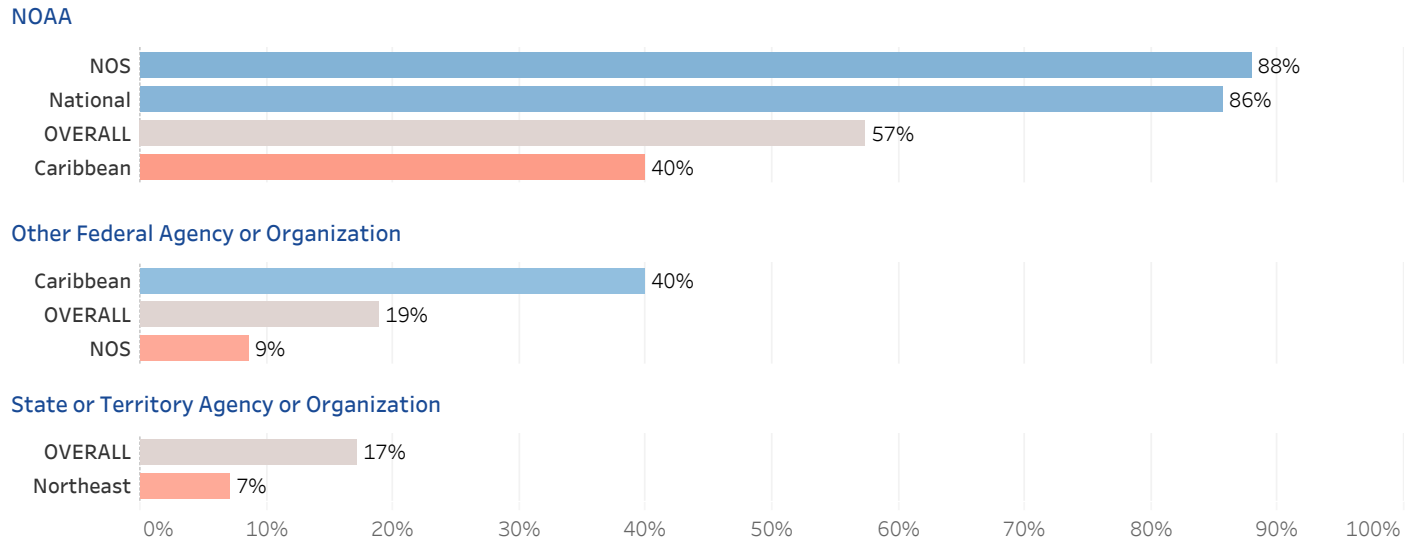
More than half of respondents (57%) say their agency or organization is NOAA, 19% say it is a non-NOAA federal agency or organization, and 17% say it is a state or territory agency or organization. Very few respondents say their agency or organization is one at the county or municipal level (3%) or that is some other type of agency or organization (3%).

Figure 1a: What is the name of your organization/agency? (Coded)



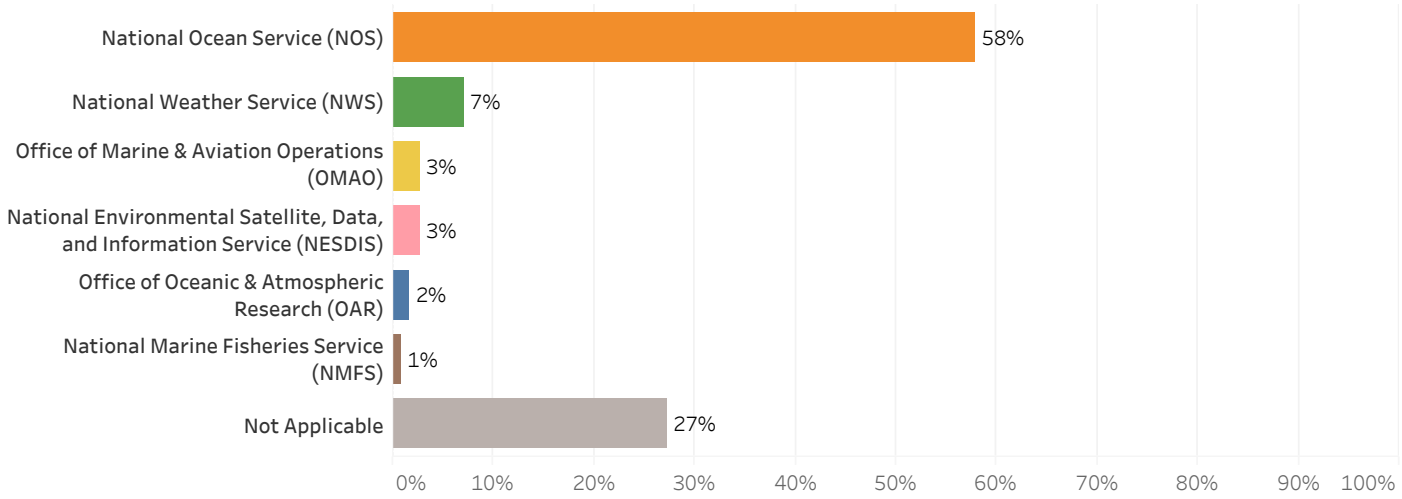
- Respondents whose line office is NOS and those who represent the nation are more likely than others to say their agency or organization is NOAA while those who represent the Caribbean are less likely to say this.
- Respondents who represent the Caribbean are more likely than others to say their agency or organization is a federal agency or organization other than NOAA while those whose line office is the NOS are less likely to say this.
- Respondents who represent the Northeast are less likely than others to say their agency or organization is a state or territory agency or organization.

Figure 1b: What is the name of your organization/agency? - By Selected Demographics



Respondents were asked to select which line office they are a part of if they work for NOAA or are a contractor for them. More than half of respondents (58%) say their line office is the National Ocean Service (NOS), while very few say their line office is the National Weather Service (NWS) (7%), the Office of Marine & Aviation Operations (OMAO) (3%), the National Environmental Satellite, Data, and Information Service (NESDIS) (3%), the Office of Oceanic & Atmospheric Research (OAR) (2%), or the National Marine Fisheries Service (NMFS) (1%). More than a quarter of respondents (27%) say that this question was not applicable.

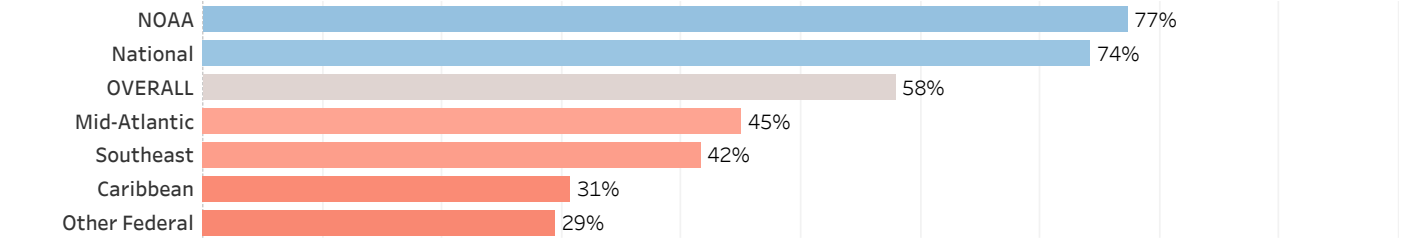
Figure 2a: If you work or are a contractor for NOAA, select your appropriate line office:



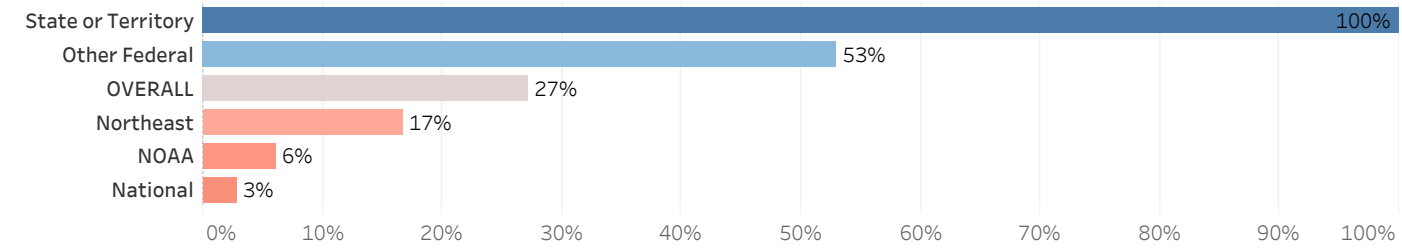
- Respondents who are a part of NOAA and those who represent the nation are more likely than others to select the National Ocean Service as their line office. Those who are a part of a federal agency or organization other than NOAA and those who represent the Caribbean, Southeast, and Mid-Atlantic are less likely to say this.
- Respondents who are a part of a state or territory agency or organization or are a part of a federal agency or organization other than NOAA are more likely than others to say that this question is not applicable. Those who represent the nation or the Northeast and those who are part of NOAA are less likely to say this.

Figure 2b: If you work or are a contractor for NOAA, select your appropriate line office - By Selected Demographics

National Ocean Service (NOS)

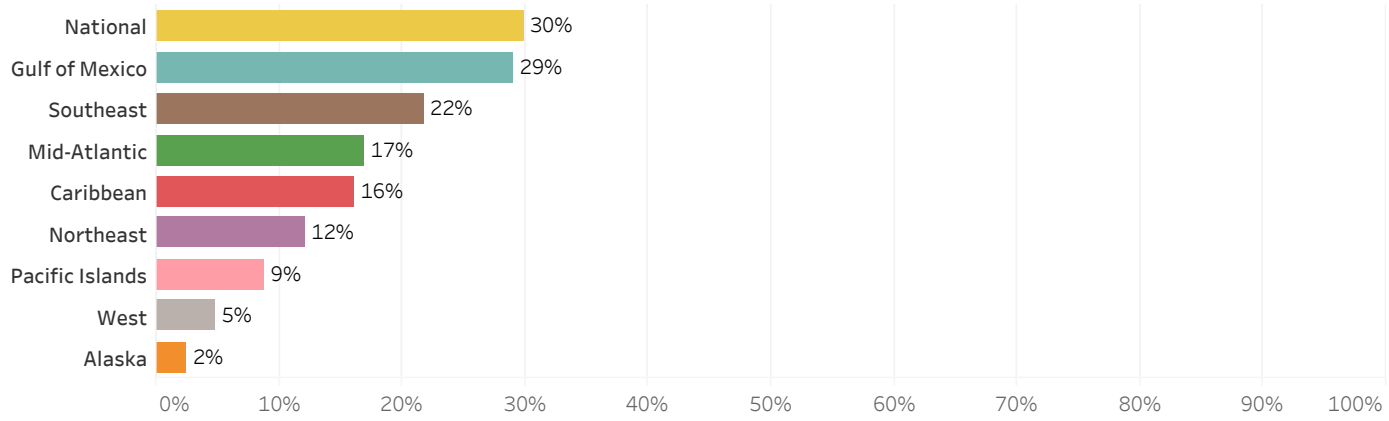


Not Applicable



When asked what state or region they represent, three in ten respondents each say they represent the nation (30%) or the Gulf of Mexico (29%). Less than one-quarter represent the Southeast (22%), the Mid-Atlantic (17%), the Caribbean (16%), or the Northeast (12%). Less than ten percent of respondents represent the Pacific Islands (9%), the West (5%), or Alaska (2%).

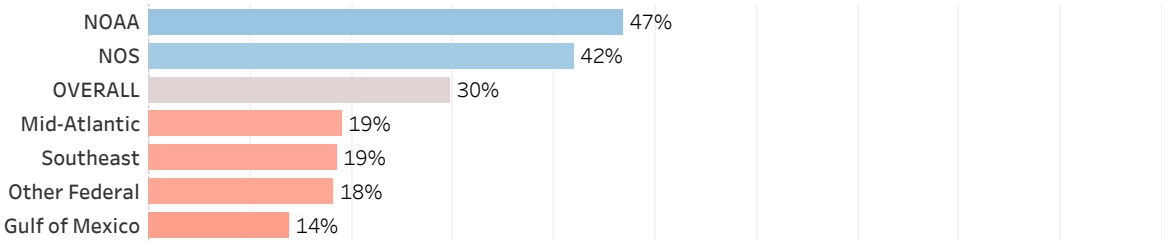
Figure 3a: What region or state do you represent? (Select all that apply)



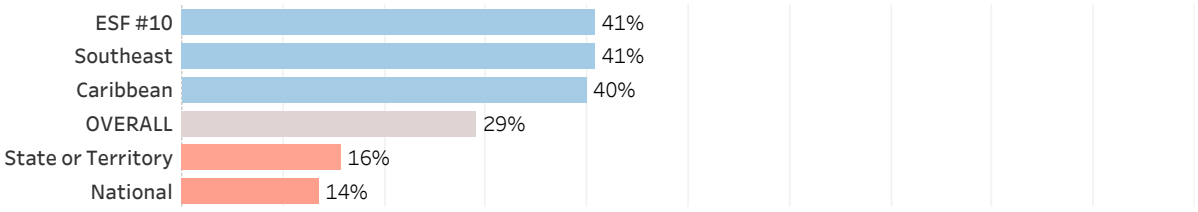
- Respondents who are part of NOAA and those whose line office is the NOS are more likely than others to say they represent the nation. Those who represent the Gulf of Mexico, Southeast, or Mid-Atlantic and those who are part of a federal agency or organization other than NOAA are less likely to say this.
- Respondents who work under ESF #10 and those who represent the Southeast or the Caribbean are more likely than others to say they represent the Gulf of Mexico. Those who represent the nation and those who are part of a state or territory agency or organization are less likely to say this.
- Respondents who represent the Caribbean, Northeast, or Mid-Atlantic are more likely than others to say they represent the Southeast.

Figure 3b: What region or state do you represent - By Selected Demographics

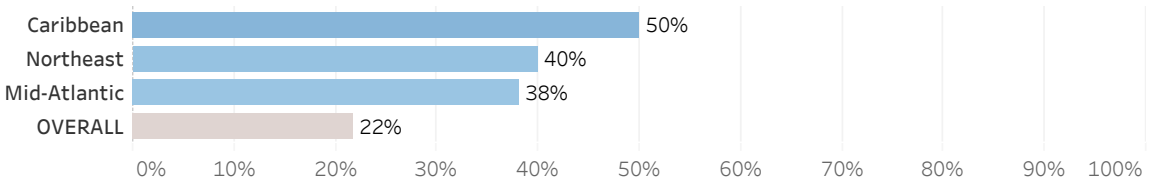
National



Gulf of Mexico



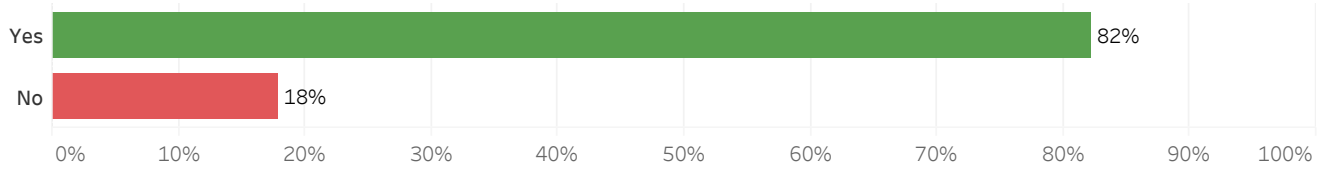
Southeast



Hurricane Preparedness & Response

Just over four in five respondents (82%) say their agency or organization has a hurricane preparedness or response plan while 18% do not.

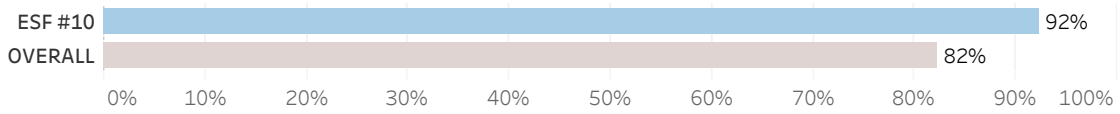
Figure 4a: Does your organization/agency have a hurricane preparedness/response plan?



- Respondents who work under ESF #10 are more likely than others to say their agency or organization has a hurricane preparedness or response plan.

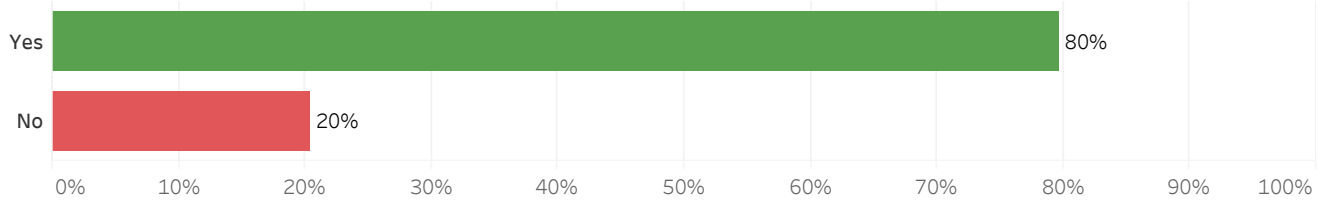
Figure 4b: Have a hurricane preparedness/response plan - By Selected Demographics

Yes



Among respondents whose agency or organization has a hurricane preparedness or response plan (N=93), four in five (80%) say their agency's or organization's hurricane preparedness or response plan includes provisions regarding the COVID-19 pandemic while 20% say their plan does not include any such provisions.

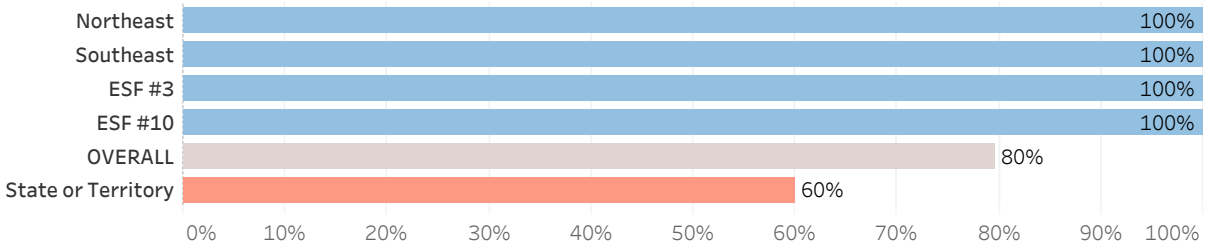
Figure 5a: Does your organization's/agency's hurricane preparedness/response plan include provisions regarding the COVID-19 pandemic?



- Respondents who represent the Northeast and Southeast and those who work under ESF #3 and ESF #10 are more likely than others to say their hurricane preparedness/response plan includes provisions regarding the COVID-19 pandemic. Those who are a state or territory agency or organization are less likely to say this.

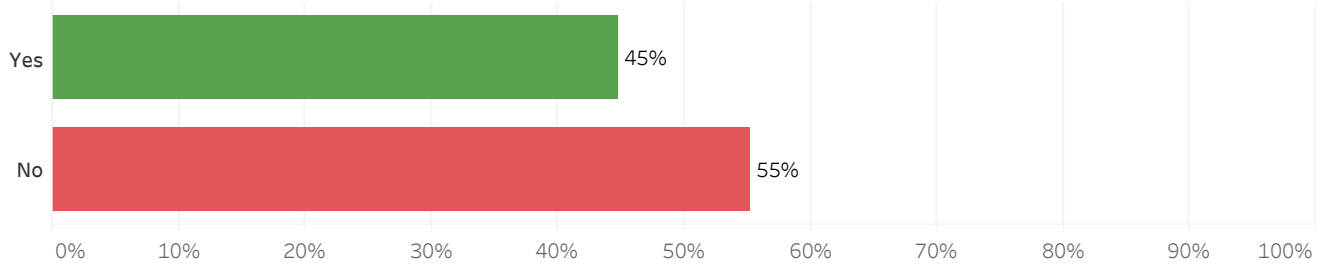
Figure 5b: Does your hurricane preparedness/response plan include provisions regarding the COVID-19 pandemic - By Selected Demographics

Yes



Just under half (45%) of respondents say that differences between local, state, and federal guidelines created challenges for a timely and effective response in 2020 for their organization or agency while 55% say that there were no such challenges.

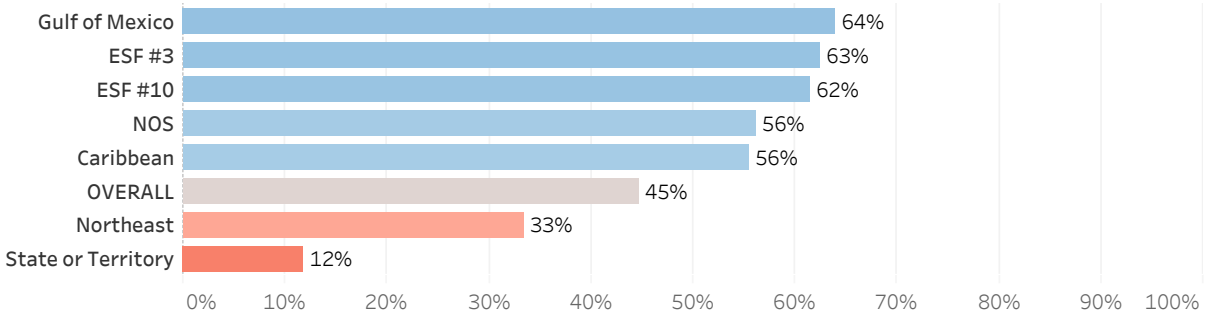
Figure 6a: Did differences between local/state/federal guidelines create challenges for a timely and effective response in 2020 for their organization/agency?



- Respondents who represent the Gulf of Mexico and the Caribbean, those who work under ESF #3 and ESF #10, and those who are in the NOS line office are more likely than others to say that differences between local, state, and federal guidelines created challenges for a timely and effective response in 2020 for their organization or agency while those who are in a state or territory agency and those who represent the Northeast are less likely to say this.

Figure 6b: Did differences between local/state/federal guidelines create challenges for a timely and effective response in 2020 for their organization/agency - By Selected Demographics

Yes

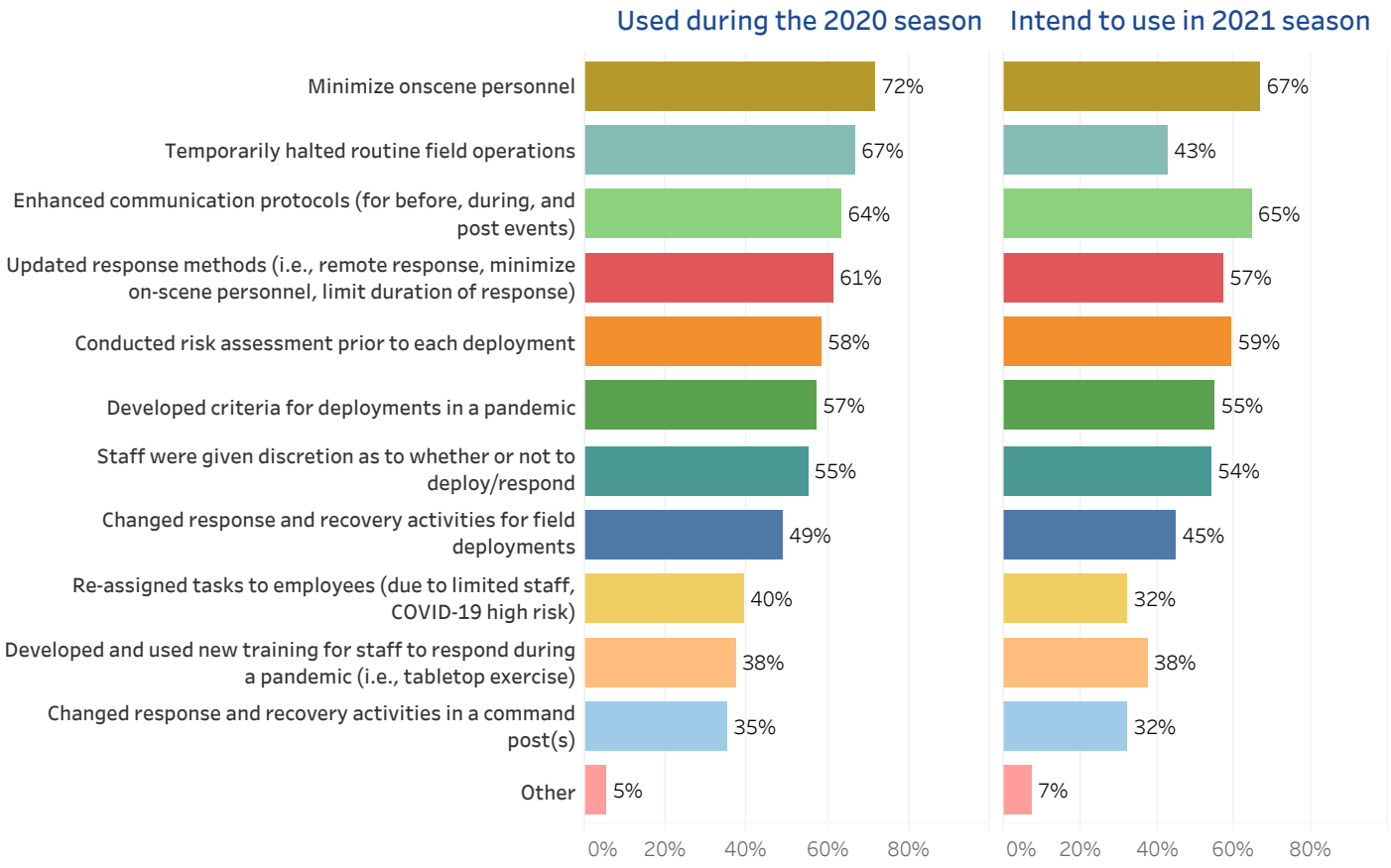


More than two-thirds of respondents used the best practices of minimizing onscene personnel (72%) and temporarily halting routine field operations (67%) during the 2020 hurricane season. Majorities enhanced communication protocols (64%), updated response methods (61%), conducted risk assessment prior to each deployment (58%), developed criteria for deployments in a pandemic (57%), and gave staff discretion as to whether or not to deploy or respond (55%) during the 2020 hurricane season. Less than half changed response and recovery activities for field deployments (49%), re-assigned tasks to employees (40%), developed and used new training for staff to respond during a pandemic (38%), or changed response and recovery activities in a command post (35%).

When asked which of these best practices respondents intend to use in the 2021 hurricane season, a majority plan to minimize onscene personnel (67%), enhance communication protocols (65%), conduct risk assessment prior to each deployment (59%), update response methods (57%), develop criteria for deployments in a pandemic (55%), and give staff discretion as to whether or not to deploy or respond (54%), while fewer respondents intend to change response and recovery activities for field deployments (45%), temporarily halt routine field operations (43%), develop and use new training for staff to respond during a pandemic (38%), re-assign tasks to employees (32%), or change response and recovery activities in a command post (32%).

Respondents are much less likely to intend to temporarily halt routine field operations in 2021 than they did in 2020.

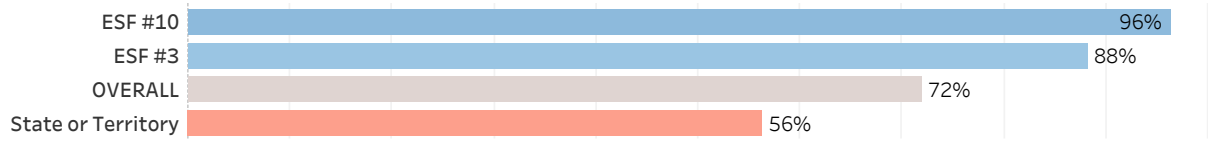
Figure 7a: Based on the following list of best practices, please select each practice you used during the 2020 hurricane season and if you intend to use that best practice in the 2021 hurricane season.



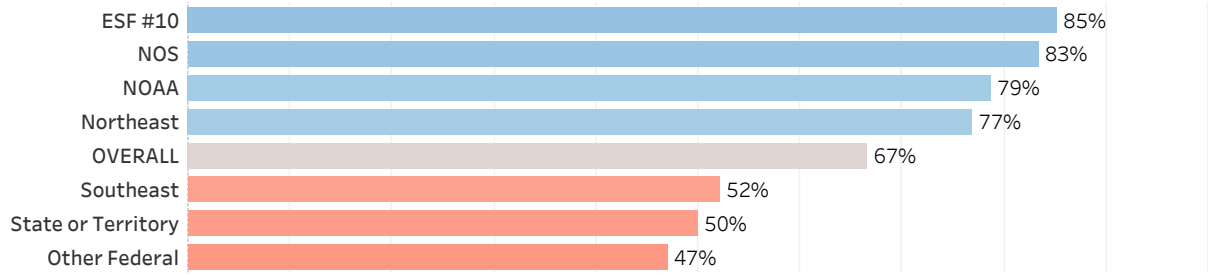
- Respondents who work under ESF #10 and ESF #3 are more likely than others to say they minimized onscene personnel during the 2020 hurricane season. Those who are a state or territory organization are less likely to say this.
- Respondents who work under ESF #10, those whose line office is the NOS, those who are part of NOAA, and those who represent the Northeast are more likely than others to say they temporarily halted routine field operations during the 2020 hurricane season. Those who are a federal agency or organization other than NOAA or a state or territory organization and those who represent the Southeast are less likely to say this.
- Respondents who work under ESF #3 and ESF #10 and those whose line office is the NOS are more likely than others to say they enhanced communication protocols during the 2020 hurricane season. Those who represent the Mid-Atlantic and those who are a state or territory organization are less likely to say this.
- Respondents who work under ESF #10 and ESF #3 are more likely than others to say they updated response methods during the 2020 hurricane season. Those who are a state or territory organization or a federal agency or organization other than NOAA are less likely to say this.

Figure 7b: Best practice used during the 2020 hurricane season - By Selected Demographics

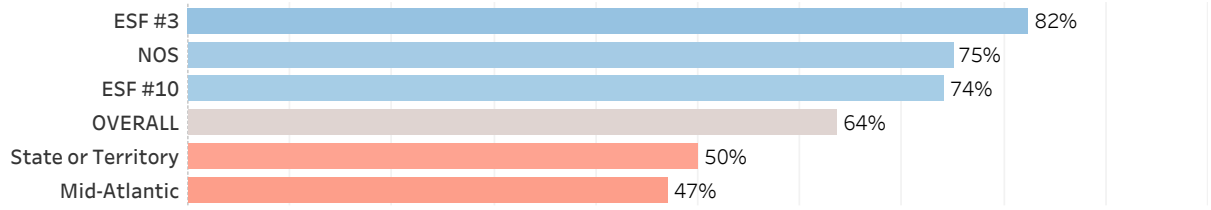
Minimize Onscene Personnel



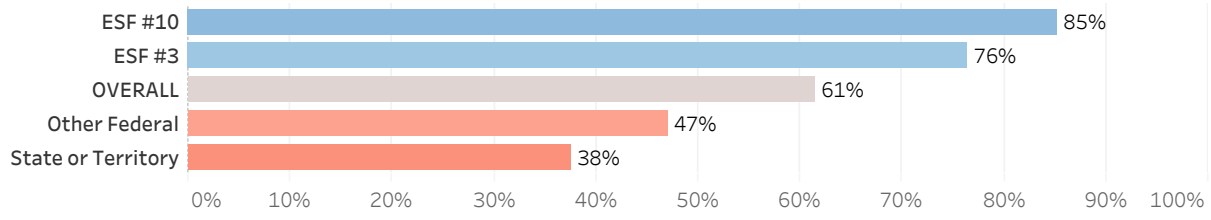
Temporarily halted routine field operations



Enhanced communication protocols (for before, during, and post events)



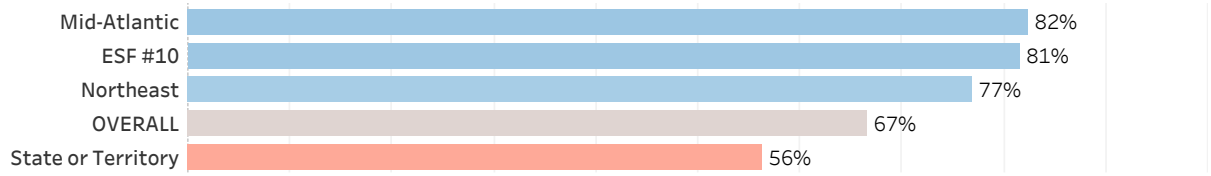
Updated response methods (i.e. remote response, minimize on-scene personnel, limit duration of response)



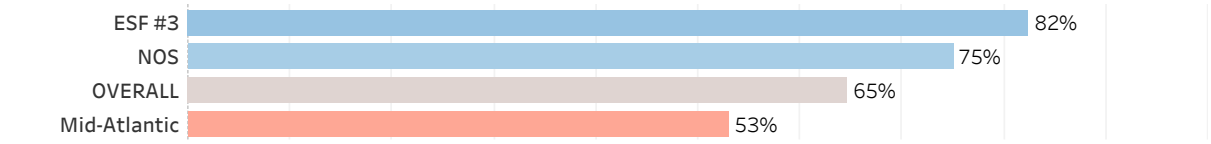
- Respondents who represent the Mid-Atlantic and Northeast and those who work under ESF #10 are more likely than others to say they intend to minimize onscene personnel during the 2021 hurricane season. Those who are part of a state or territory organization are less likely to say this.
- Respondents who work under ESF #3 and those whose line office is the NOS are more likely than others to say they intend to enhance communication protocols during the 2021 hurricane season. Those who represent the Mid-Atlantic are less likely to say this.
- Respondents who work under ESF #3 and ESF #10 and those whose line office is the NOS are more likely than others to say they intend to conduct risk assessment prior to each deployment during the 2021 hurricane season. Those who are a federal agency or organization other than NOAA are less likely to say this.
- Respondents who work under ESF #10 and ESF #3, those whose line office is the NOS, and those who are part of NOAA are more likely to say they intend to update response methods during the 2021 hurricane season. Those who are a state or territory organization or a federal agency or organization other than NOAA are less likely to say this.

Figure 7c: Best practice intend to use during the 2021 hurricane season - By Selected Demographics

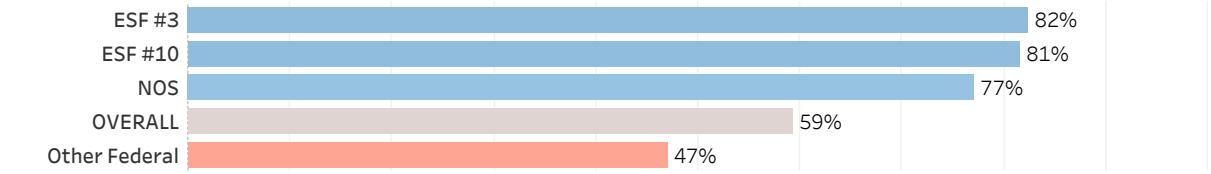
Minimize Onscene Personnel



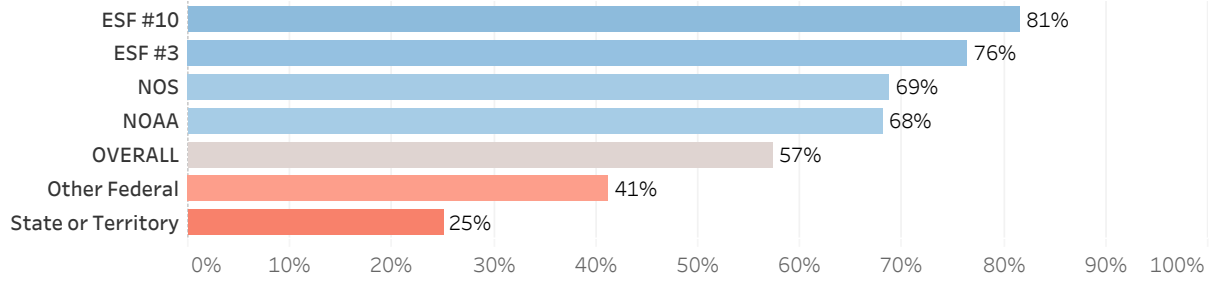
Enhance communication protocols (for before, during, and post events)



Conduct risk assessment prior to each deployment

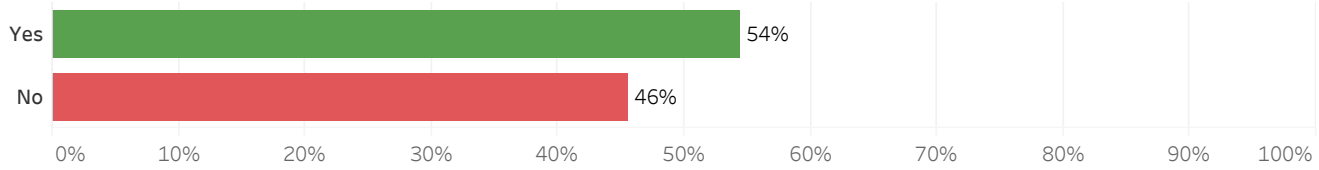


Updated response methods (i.e. remote response, minimize on-scene personnel, limit duration of response)



Just over half of respondents (54%) say that they know how to work through FEMA to get access to NOAA and other federal agency expertise while 46% do not.

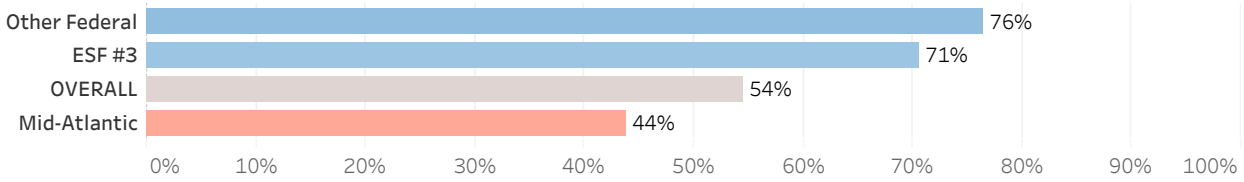
Figure 8a: Do you know how to work through FEMA to get access to NOAA and other federal agency expertise?



- Respondents who are part of a federal agency or organization other than NOAA and those who work under ESF #3 are more likely than others to say they know how to work through FEMA to get access to NOAA and other federal agency expertise while those who represent the Mid-Atlantic are less likely to say this.

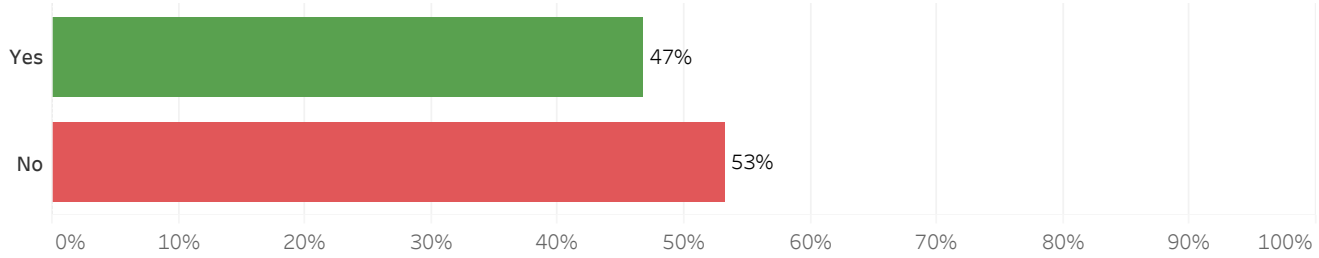
Figure 8b: Know how to work through FEMA to get access to NOAA and other federal agency expertise - By Selected Demographics

Yes



Just under half of respondents (47%) say that they have a Mission Essential Function (MEF) or Emergency Support Function (ESF) role in hurricane response while 53% do not.

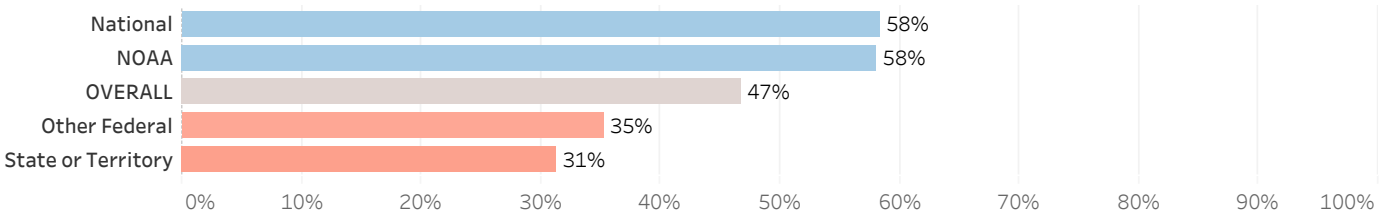
Figure 9a: Do you have a Mission Essential Function (MEF) or Emergency Support Function (ESF) role in hurricane response?



- Respondents who represent the nation and those who are part of NOAA are more likely to say they have a Mission Essential Function (MEF) or Emergency Support Function (ESF) role in hurricane response while those who are part of a state or territory agency or organization or are part of a federal agency or organization other than NOAA are less likely to say this.

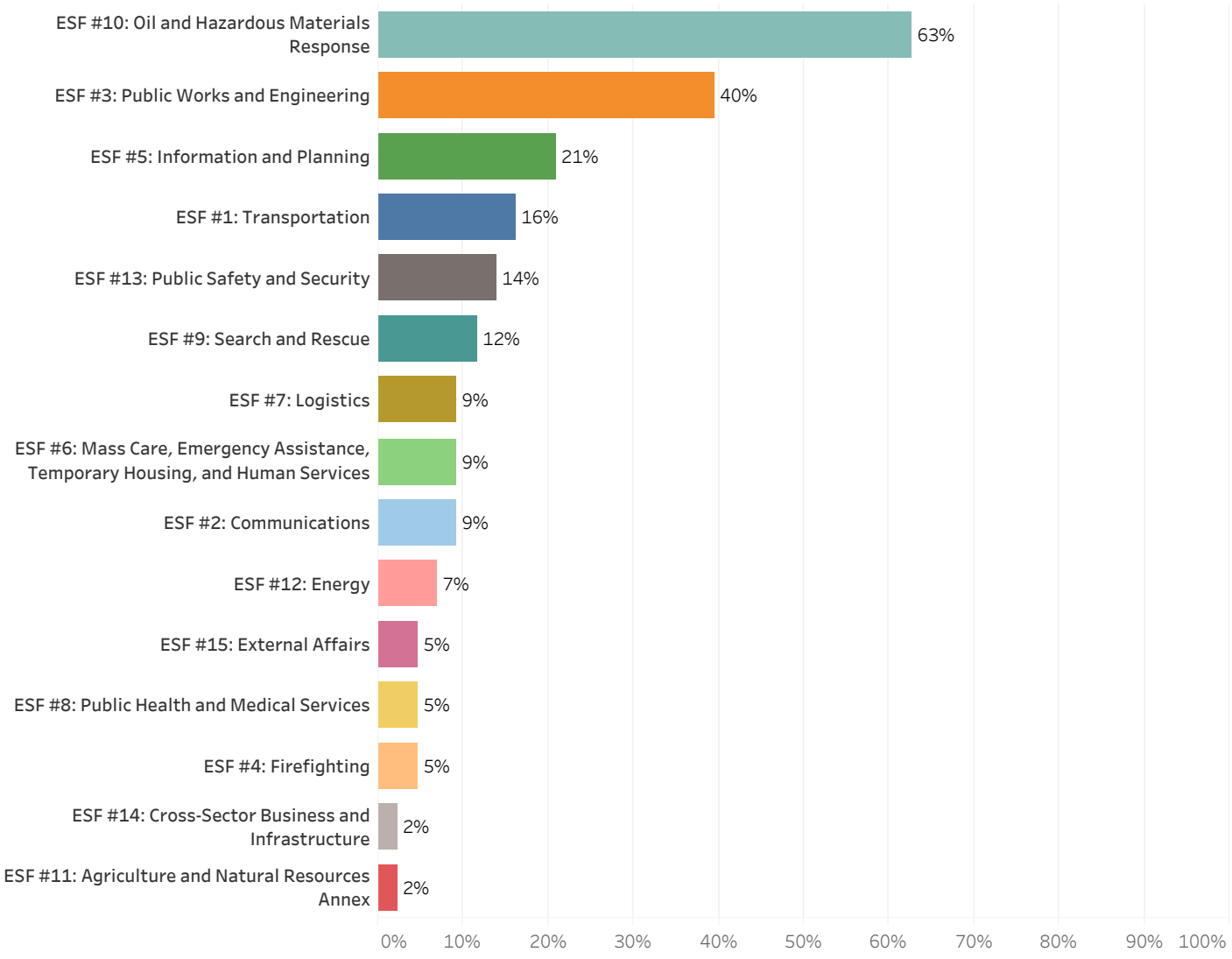
Figure 9b: Have a Mission Essential Function (MEF) or Emergency Support Function (ESF) role in hurricane response - By Selected Demographics

Yes



Among respondents who indicate that they have a Mission Essential Function (MEF) or Emergency Support Function (ESF) role in hurricane response (N=43), more than three in five (63%) work under ESF #10: Oil and Hazardous Materials Response. Four in ten (40%) work under ESF #3: Public Works and Engineering while about one in five work under ESF #5: Information and Planning (21%). Fewer respondents work under ESF #1: Transportation (16%), ESF #13: Public Safety and Security (14%), ESF #9: Search and Rescue (12%), ESF #7 Logistics (9%), ESF: #6 Mass Care, Emergency Assistance, Temporary Housing, and Human Services (9%), ESF #2: Communications (9%), ESF #12: Energy (7%), ESF #15: External Affairs (5%), ESF #8: Public Health and Medical Services (5%), ESF #4: Firefighting (5%), ESF #14: Cross-Sector Business and Infrastructure (2%), and ESF #11: Agriculture and Natural Resources Annex (2%).

Figure 10: Please select the ESF's you work under (Select all that apply)

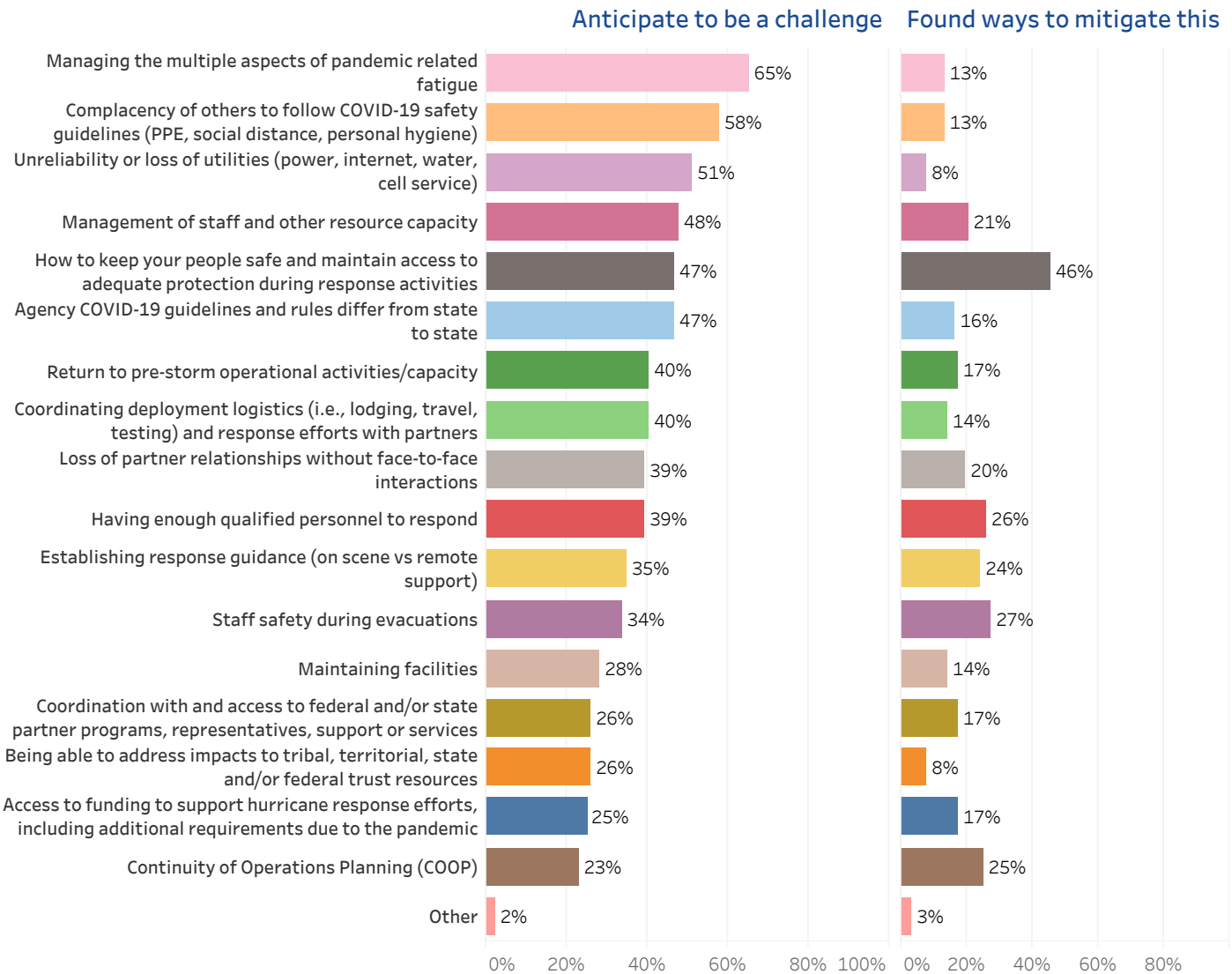


Challenges

Two-thirds of respondents (65%) anticipate that managing the multiple aspects of pandemic related fatigue will be a challenge for the 2021 hurricane season while 58% anticipate that complacency of others to follow COVID-19 safety guidelines will be a challenge. About half of respondents say the same about unreliability or loss of utilities (51%), management of staff and other resource capacity (48%), keeping their people safe and maintaining access to adequate protection during response activities (47%), and how agency COVID-19 guidelines and rules differ from state to state (47%). About two in five anticipate returning to pre-storm operational activities or capacity (40%), coordinating deployment logistics and response efforts with partners (40%), loss of partner relationships without face-to-face interactions (39%), and having enough qualified personnel to respond (39%) as challenges for the 2021 hurricane season while about one-third or less say the same about establishing response guidance (35%), staff safety during evacuations (34%), maintaining facilities (28%), coordination with and access to federal and/or state partner programs, representatives, support or services (26%), being able to address impacts to tribal, territorial, state and/or federal trust resources (26%), access to funding to support hurricane response efforts, including additional requirements due to the pandemic (25%), and continuity of operations planning (23%).

Respondents are most likely to have found ways to mitigate how to keep their people safe and maintain access to adequate protection during response activities (46%), staff safety during evacuations (27%), having enough qualified personnel to respond (26%), and continuity of operations planning (25%).

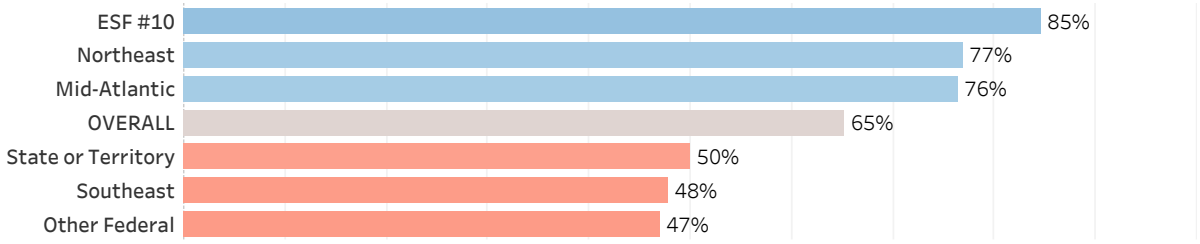
Figure 11a: Which of the following do you anticipate as challenges for the 2021 hurricane season? (Select all that apply)



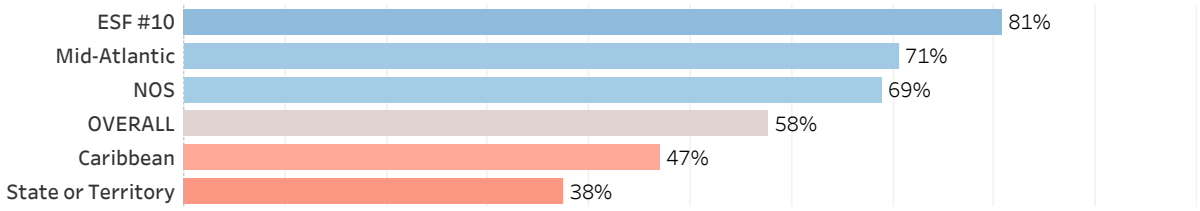
- Respondents who work under ESF #10 and those who represent the Northeast or Mid-Atlantic are more likely than others to say they anticipate managing the multiple aspects of pandemic related fatigue as a challenge for the 2021 hurricane season. Those who are a federal agency or organization other than NOAA or a state or territory agency or organization and those who represent the Southeast are less likely to say this.
- Respondents who work under ESF #10, those who represent the Mid-Atlantic, and those whose line office in the NOS are more likely than others to say they anticipate complacency of others to follow COVID-19 safety guidelines to be a challenge for the 2021 hurricane season. Those who are a state or territory agency or organization and those who represent the Caribbean are less likely to say this.
- Respondents who work under ESF #10 are more likely than others to say they anticipate unreliability or loss of utilities as a challenge for the 2021 hurricane season.
- Respondents who represent the Northeast are more likely than others to say they anticipate management of staff and other resource capacity as a challenge for the 2021 hurricane season while those who represent the Southeast are less likely to say this.

Figure 11b: Which of the following do you anticipate as challenges for the 2021 hurricane season - By Selected Demographics

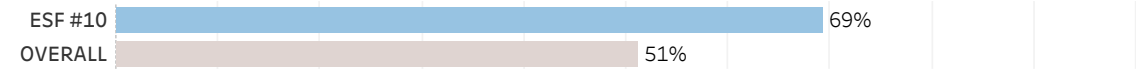
Managing the multiple aspects of pandemic related fatigue



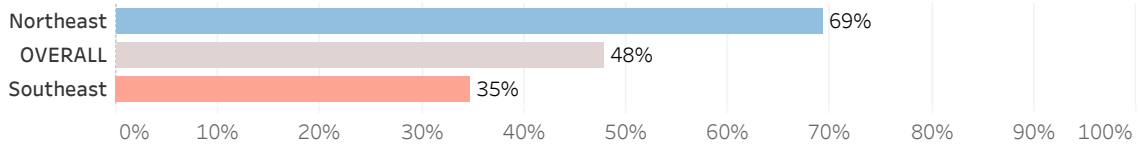
Complacency of others to follow COVID-19 safety guidelines (PPE, social distance, personal hygiene)



Unreliability or loss of utilities (power, internet, water, cell service)



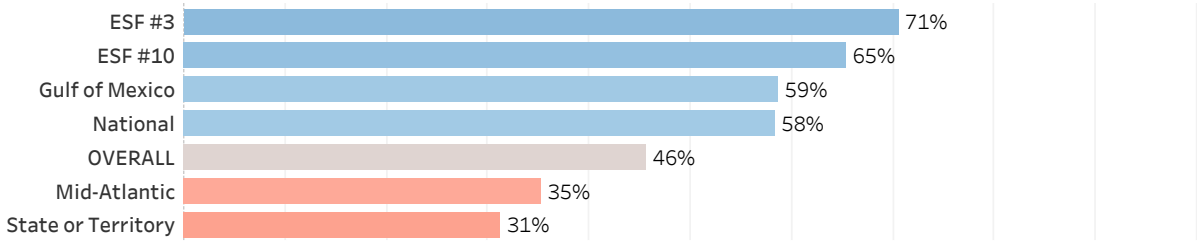
Management of staff and other resource capacity



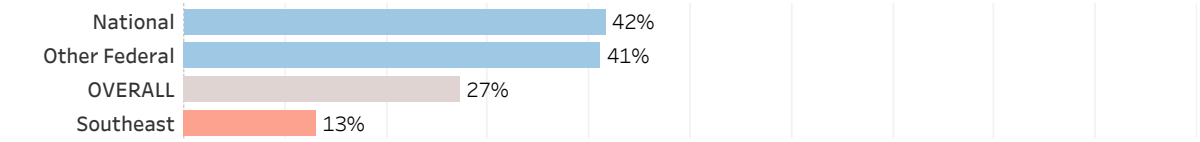
- Respondents who work under ESF #3 and ESF #10 and those who represent the Gulf of Mexico or the nation are more likely than others to say they have found ways to mitigate the challenge of how to keep their people safe and maintain access to adequate protection during response activities. Those who are part of a state or territory agency or organization and those who represent the Mid-Atlantic are less likely to say this.
- Respondents who represent the nation and those who are a part of a federal agency or organization other than NOAA are more likely than others to say they have found ways to mitigate the challenge of staff safety during evacuations while those who represent the Southeast are less likely to say this.
- Respondents who represent the Northeast or Mid-Atlantic, those who are a part of a federal agency or organization other than NOAA, and those who work under ESF #3 are more likely than others to say they have found ways to mitigate the challenge of continuity of operations planning.

Figure 11c: Have you found ways to mitigate these challenges - By Selected Demographics

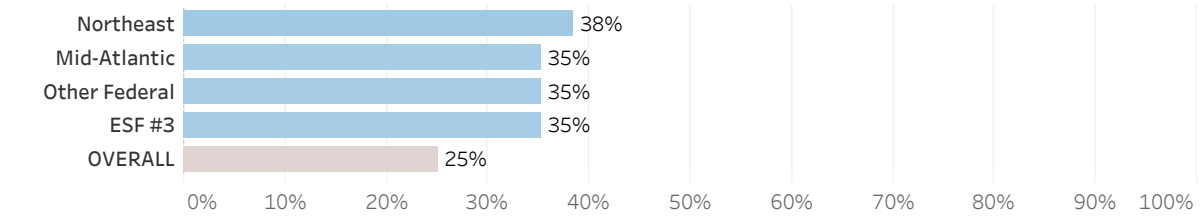
How to keep your people safe and maintain access to adequate protection during response activities



Staff safety during evacuations



Continuity of operations planning



Among respondents who anticipate each of the following to be challenges for the 2021 hurricane season, at least nine in ten view how to keep their people safe and maintain access to adequate protection during response activities (93%), managing the multiple aspects of pandemic related fatigue (91%), and continuity of operations planning (90%) as substantial or moderate challenges. Four in five or more say the same about returning to pre-storm operational activities/capacity (89%), complacency of others to follow COVID-19 safety guidelines (88%), access to funding to support hurricane response efforts, including additional requirements due to the pandemic (87%), coordination with and access to federal and/or state partner programs, representatives, support or services (87%), maintaining facilities (85%), unreliability of loss of utilities (84%), coordinating deployment logistics and response efforts with partners (83%), having enough qualified personnel to respond (80%), and management of staff and other resource capacity (80%). Smaller majorities see loss of partner relationships without face-to-face interactions (78%), being able to address impacts to tribal, territorial, state and/or federal trust resources (75%), agency COVID-19 guidelines and rules differing from state to state (73%), staff safety during evacuations (67%), and establishing response guidance (66%) as substantial or moderate challenges.

Figure 12: How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season?

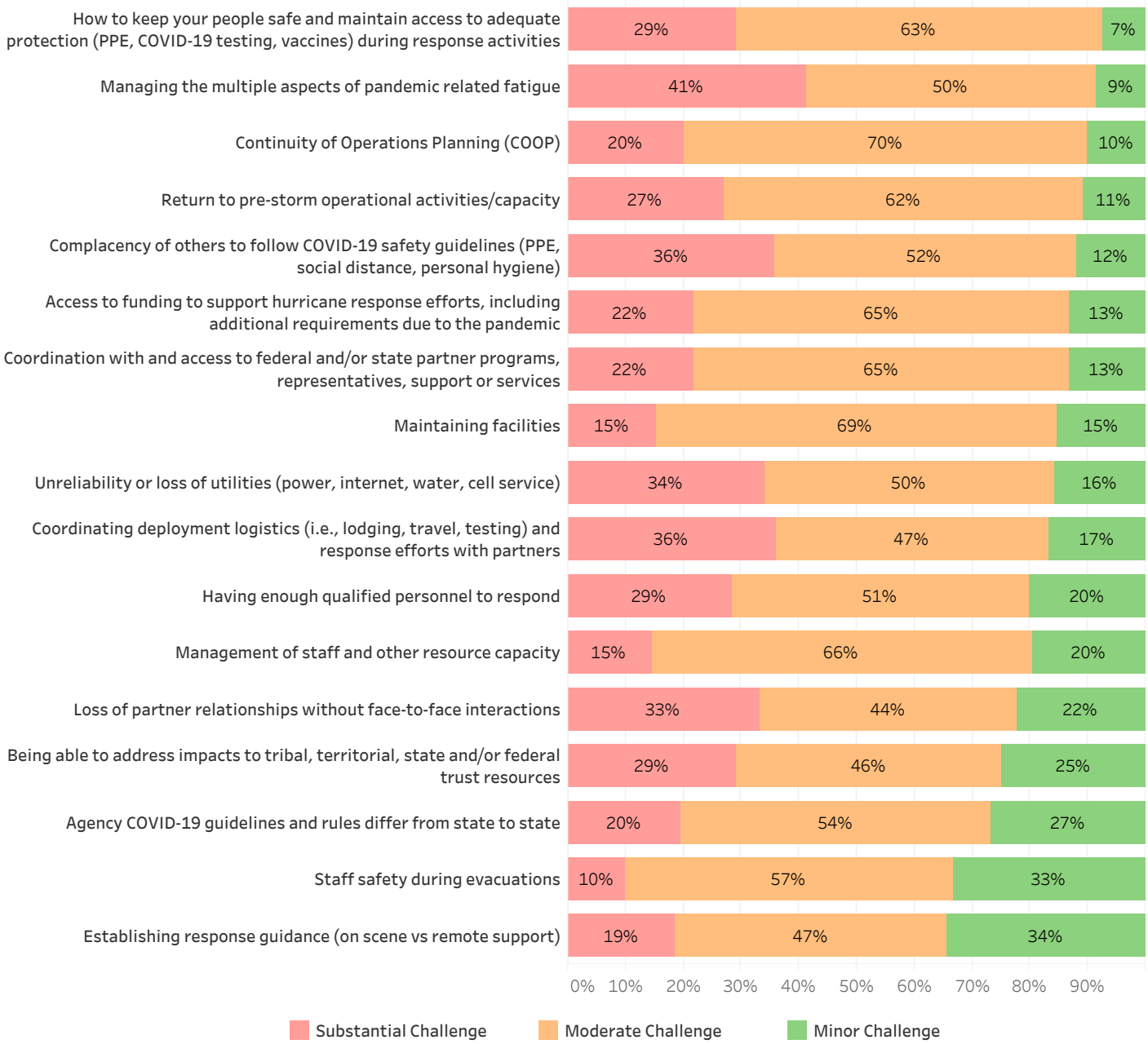


Figure 12b: Anticipate challenges for the 2021 hurricane season

	% Found Ways To Mitigate	% Substantial Challenge
Managing the multiple aspects of pandemic related fatigue	13%	41%
Complacency of others to follow COVID-19 safety guidelines (PPE, social distance, personal hygiene)	13%	36%
Unreliability or loss of utilities (power, internet, water, cell service)	8%	34%
Management of staff and other resource capacity	21%	15%
How to keep your people safe and maintain access to adequate protection during response activities	46%	29%
Agency COVID-19 guidelines and rules differ from state to state	16%	20%
Return to pre-storm operational activities/capacity	17%	27%
Coordinating deployment logistics (i.e., lodging, travel, testing) and response efforts with partners	14%	36%
Loss of partner relationships without face-to-face interactions	20%	33%
Having enough qualified personnel to respond	26%	29%
Establishing response guidance (on scene vs remote support)	24%	19%
Staff safety during evacuations	27%	10%
Maintaining facilities	14%	15%
Coordination with and access to federal and/or state partner programs, representatives, support or services	17%	22%
Being able to address impacts to tribal, territorial, state and/or federal trust resources	8%	29%
Access to funding to support hurricane response efforts, including additional requirements due to the pandemic	17%	22%
Continuity of Operations Planning (COOP)	25%	20%

Appendix A

Q1 What is the name of your organization/agency?

		County or Municipal Agency or Organization	NOAA	Other Agency or Organization	Other Federal Agency or Organization	State or Territory Agency or Organization	N
OVERALL		3%	57%	3%	19%	17%	122
Line Office	NESDIS		100%				3
	NMFS		100%				1
	NOS		88%	3%	9%		58
	NWS		40%		60%		5
	OAR		100%				2
	OMAO		100%				3
Region	Alaska		67%		33%		3
	Caribbean		40%	5%	40%	15%	20
	Gulf of Mexico	6%	61%		24%	9%	33
	Mid-Atlantic		58%		16%	26%	19
	National		86%	3%	11%		35
	Northeast		57%	7%	29%	7%	14
	Pacific Islands	13%	38%		25%	25%	8
	Southeast		60%		20%	20%	25
	West	20%	60%		20%		5
ESF	ESF #1		100%				7
	ESF #2		100%				3
	ESF #3	7%	60%		20%	13%	15
	ESF #4		100%				2
	ESF #5		71%		14%	14%	7
	ESF #6	25%	75%				4
	ESF #7		67%		33%		3
	ESF #8		100%				2
	ESF #9		80%			20%	5
	ESF #10	4%	67%	4%	17%	8%	24
	ESF #11		100%				1
	ESF #12	67%	33%				3
	ESF #13	20%	80%				5
	ESF #14					100%	1
	ESF #15	50%	50%				2

Q2 If you work or are a contractor for NOAA, select your appropriate line office:

		National Environmental Satellite, Data, and Information Service (NESDIS)	National Marine Fisheries Service (NMFS)	National Ocean Service (NOS)	National Weather Service (NWS)
OVERALL		3%	1%	58%	7%
Org or Agency Type	County or Municipal				
	NOAA	5%	2%	77%	3%
	Other Federal			29%	18%
	Other Type			50%	
	State or Territory				
Region	Alaska		50%	50%	
	Caribbean		8%	31%	15%
	Gulf of Mexico	3%	3%	55%	13%
	Mid-Atlantic		5%	45%	5%
	National	9%	3%	74%	9%
	Northeast		8%	50%	
	Pacific Islands		11%	56%	
	Southeast	4%	4%	42%	8%
	West		25%	50%	
ESF	ESF #1			43%	14%
	ESF #2			33%	
	ESF #3			64%	7%
	ESF #4				50%
	ESF #5			57%	14%
	ESF #6				
	ESF #7			50%	
	ESF #8				50%
	ESF #9			25%	25%
	ESF #10			65%	9%
	ESF #11				
	ESF #12				
	ESF #13				33%
	ESF #14				
	ESF #15			50%	

Q2 If you work or are a contractor for NOAA, select your appropriate line office:

		Office of Marine & Aviation Operations (OMAO)	Office of Oceanic & Atmospheric Research (OAR)	Not Applicable	N
OVERALL		3%	2%	27%	114
Org or Agency Type	County or Municipal			100%	2
	NOAA	5%	3%	6%	66
	Other Federal			53%	17
	Other Type			50%	4
	State or Territory			100%	14
Region	Alaska				2
	Caribbean	15%		31%	13
	Gulf of Mexico	6%		19%	31
	Mid-Atlantic	10%	5%	30%	20
	National	3%		3%	35
	Northeast	8%	17%	17%	12
	Pacific Islands			33%	9
	Southeast	8%		33%	24
	West	25%			4
ESF	ESF #1	14%		29%	7
	ESF #2			67%	3
	ESF #3			29%	14
	ESF #4			50%	2
	ESF #5			29%	7
	ESF #6			100%	3
	ESF #7			50%	4
	ESF #8			50%	2
	ESF #9	25%		25%	4
	ESF #10	4%		22%	23
	ESF #11			100%	1
	ESF #12			100%	3
	ESF #13	17%		50%	6
	ESF #14			100%	1
	ESF #15			50%	2

Q3 What region or state do you represent? (Select all that apply)

		Alaska	Caribbean	Gulf of Mexico	Mid-Atlantic	National
OVERALL		2%	16%	29%	17%	30%
Line Office	NESDIS			33%		100%
	NMFS	100%	100%	100%	100%	100%
	NOS	2%	6%	27%	15%	42%
	NWS		25%	50%	13%	38%
	OAR				50%	
	OMAO		67%	67%	67%	33%
Org or Agency Type	County or Municipal			50%		
	NOAA	3%	13%	31%	17%	47%
	Other Federal	5%	36%	36%	14%	18%
	Other Type		33%			33%
	State or Territory		16%	16%	26%	
Region	Alaska	100%	100%	100%	100%	100%
	Caribbean	15%	100%	40%	25%	20%
	Gulf of Mexico	8%	22%	100%	22%	14%
	Mid-Atlantic	14%	24%	38%	100%	19%
	National	8%	11%	14%	11%	100%
	Northeast	20%	33%	33%	47%	20%
	Pacific Islands	27%	27%	27%	27%	27%
	Southeast	11%	37%	41%	30%	19%
	West	50%	67%	67%	67%	50%
ESF	ESF #1		29%	29%	29%	43%
	ESF #2	25%	50%	25%	25%	50%
	ESF #3		6%	24%		24%
	ESF #4		50%	50%		
	ESF #5	22%	44%	33%	22%	44%
	ESF #6	25%	50%	25%	25%	50%
	ESF #7	25%	50%	25%	50%	25%
	ESF #8		50%	50%		
	ESF #9		40%	40%	20%	20%
	ESF #10		19%	41%	15%	22%
	ESF #11		100%			
	ESF #12		33%	33%		
	ESF #13		17%	33%	17%	17%
	ESF #14					
	ESF #15					

Q3 What region or state do you represent? (Select all that apply)

		Northeast	Pacific Islands	Southeast	West	N
OVERALL		12%	9%	22%	5%	124
Line Office	NESDIS			33%		3
	NMFS	100%	100%	100%	100%	1
	NOS	10%	8%	16%	3%	62
	NWS			25%		8
	OAR	100%				2
	OMAO	33%		67%	33%	3
Org or Agency Type	County or Municipal		25%		25%	4
	NOAA	13%	5%	23%	5%	64
	Other Federal	18%	9%	23%	5%	22
	Other Type	33%				3
	State or Territory	5%	11%	26%		19
Region	Alaska	100%	100%	100%	100%	3
	Caribbean	25%	15%	50%	20%	20
	Gulf of Mexico	14%	8%	31%	11%	36
	Mid-Atlantic	33%	14%	38%	19%	21
	National	8%	8%	14%	8%	37
	Northeast	100%	20%	40%	20%	15
	Pacific Islands	27%	100%	27%	36%	11
	Southeast	22%	11%	100%	15%	27
	West	50%	67%	67%	100%	6
ESF	ESF #1	29%		43%		7
	ESF #2	25%	50%	50%	25%	4
	ESF #3	12%	12%	18%		17
	ESF #4			50%		2
	ESF #5	22%	33%	44%	22%	9
	ESF #6	25%	50%	50%	25%	4
	ESF #7	50%	50%	75%	25%	4
	ESF #8			50%		2
	ESF #9	20%		40%		5
	ESF #10	15%	4%	22%		27
	ESF #11			100%		1
	ESF #12		33%	33%		3
	ESF #13	17%	17%	33%		6
	ESF #14			100%		1
	ESF #15		50%	50%		2

Q4 Does your organization/agency have a hurricane preparedness/response plan?

		Yes	No	N
OVERALL		82%	18%	118
Line Office	NESDIS	100%		3
	NMFS		100%	1
	NOS	83%	17%	59
	NWS	88%	13%	8
	OAR	100%		2
	OMAO	100%		3
Org or Agency Type	County or Municipal	75%	25%	4
	NOAA	90%	10%	61
	Other Federal	82%	18%	22
	Other Type	33%	67%	3
	State or Territory	72%	28%	18
Region	Alaska	67%	33%	3
	Caribbean	89%	11%	19
	Gulf of Mexico	92%	8%	36
	Mid-Atlantic	75%	25%	20
	National	83%	17%	35
	Northeast	80%	20%	15
	Pacific Islands	73%	27%	11
	Southeast	85%	15%	26
	West	50%	50%	6
ESF	ESF #1	86%	14%	7
	ESF #2	75%	25%	4
	ESF #3	88%	13%	16
	ESF #4	50%	50%	2
	ESF #5	89%	11%	9
	ESF #6	75%	25%	4
	ESF #7	100%		4
	ESF #8	50%	50%	2
	ESF #9	80%	20%	5
	ESF #10	92%	8%	26
	ESF #11	100%		1
	ESF #12	100%		3
	ESF #13	83%	17%	6
	ESF #14	100%		1
	ESF #15	100%		2

Q5 Does your organization's/agency's hurricane preparedness/response plan include provisions regarding the COVID-19 pandemic?

		Yes	No	N
OVERALL		80%	20%	93
Line Office	NESDIS	67%	33%	3
	NOS	88%	13%	48
	NWS	86%	14%	7
	OAR	100%		2
	OMAO	67%	33%	3
Org or Agency Type	County or Municipal	33%	67%	3
	NOAA	83%	17%	54
	Other Federal	78%	22%	18
	Other Type	100%		1
	State or Territory	60%	40%	10
Region	Alaska	100%		2
	Caribbean	88%	12%	17
	Gulf of Mexico	78%	22%	32
	Mid-Atlantic	86%	14%	14
	National	75%	25%	28
	Northeast	100%		12
	Pacific Islands	75%	25%	8
	Southeast	100%		20
	West	100%		3
ESF	ESF #1	100%		6
	ESF #2	100%		3
	ESF #3	100%		14
	ESF #4	100%		1
	ESF #5	100%		8
	ESF #6	100%		3
	ESF #7	100%		4
	ESF #8	100%		1
	ESF #9	100%		4
	ESF #10	100%		24
	ESF #11	100%		1
	ESF #12	67%	33%	3
	ESF #13	80%	20%	5
	ESF #15	100%		2

Q6 Did differences between local/state/federal guidelines create challenges for a timely and effective response in 2020 for your organization/agency?

		Yes	No	N
OVERALL		45%	55%	114
Line Office	NESDIS	33%	67%	3
	NMFS		100%	1
	NOS	56%	44%	57
	NWS	50%	50%	8
	OAR		100%	2
	OMAO	33%	67%	3
Org or Agency Type	County or Municipal	75%	25%	4
	NOAA	53%	47%	59
	Other Federal	38%	62%	21
	Other Type	33%	67%	3
	State or Territory	12%	88%	17
Region	Alaska	67%	33%	3
	Caribbean	56%	44%	18
	Gulf of Mexico	64%	36%	36
	Mid-Atlantic	47%	53%	19
	National	50%	50%	34
	Northeast	33%	67%	15
	Pacific Islands	60%	40%	10
	Southeast	42%	58%	26
	West	50%	50%	6
ESF	ESF #1	43%	57%	7
	ESF #2	50%	50%	4
	ESF #3	63%	38%	16
	ESF #4	50%	50%	2
	ESF #5	67%	33%	9
	ESF #6	50%	50%	4
	ESF #7	75%	25%	4
	ESF #8	50%	50%	2
	ESF #9	20%	80%	5
	ESF #10	62%	38%	26
	ESF #11		100%	1
	ESF #12	67%	33%	3
	ESF #13	50%	50%	6
	ESF #14		100%	1
	ESF #15	100%		2

Q7_1 Based on the following list of best practices, please select each practice you used during the 2020 hurricane season. (Select all that apply)

		Changed response and recovery activities for field deployments	Changed response and recovery activities in a command post(s)	Conducted risk assessment prior to each deployment	Developed and used new training for staff to respond during a pandemic (i.e., tabletop exercise)
OVERALL		49%	35%	58%	38%
Line Office	NESDIS				
	NMFS	100%			
	NOS	54%	42%	75%	38%
	NWS	67%	17%	17%	17%
	OAR			100%	100%
	OMAO	33%	33%	67%	67%
Org or Agency Type	County or Municipal	67%	67%	33%	67%
	NOAA	51%	34%	68%	36%
	Other Federal	41%	35%	47%	35%
	Other Type	33%	33%	67%	
	State or Territory	38%	31%	44%	31%
Region	Alaska	33%		33%	33%
	Caribbean	53%	47%	53%	41%
	Gulf of Mexico	63%	37%	60%	33%
	Mid-Atlantic	41%	24%	59%	29%
	National	41%	30%	59%	41%
	Northeast	38%	15%	69%	31%
	Pacific Islands	50%	38%	50%	50%
	Southeast	43%	22%	57%	30%
	West	40%	20%	40%	40%
ESF	ESF #1	71%	29%	71%	14%
	ESF #2	25%	25%	50%	75%
	ESF #3	71%	65%	82%	53%
	ESF #4	50%			
	ESF #5	44%	44%	56%	44%
	ESF #6	25%	25%	50%	75%
	ESF #7	50%	25%	50%	25%
	ESF #8	50%			
	ESF #9	60%	40%	60%	40%
	ESF #10	78%	67%	85%	48%
	ESF #11				
	ESF #12	67%	67%	33%	67%
	ESF #13	67%	17%	33%	33%
	ESF #14	100%			
	ESF #15	100%	100%	100%	50%

Q7_1 Based on the following list of best practices, please select each practice you used during the 2020 hurricane season. (Select all that apply)

		Developed criteria for deployments in a pandemic	Enhanced communication protocols (for before, during, and post events)	Minimize onscene personnel	Re-assigned tasks to employees (due to limited staff, COVID-19 high risk)	Staff were given discretion as to whether or not to deploy/respond
OVERALL		57%	64%	72%	40%	55%
Line Office	NESDIS					
	NMFS			100%	100%	
	NOS	63%	75%	77%	42%	71%
	NWS	50%	83%	67%	17%	17%
	OAR	100%	100%	100%		100%
	OMAO	100%		67%	67%	
Org or Agency Type	County or Municipal	33%	33%	67%	33%	33%
	NOAA	62%	66%	79%	43%	64%
	Other Federal	65%	65%	65%	24%	53%
	Other Type	33%	67%	33%	33%	67%
	State or Territory	44%	50%	56%	44%	31%
Region	Alaska	67%	67%	67%	67%	33%
	Caribbean	65%	59%	71%	41%	35%
	Gulf of Mexico	67%	67%	77%	47%	57%
	Mid-Atlantic	76%	47%	71%	59%	35%
	National	56%	63%	70%	44%	59%
	Northeast	69%	62%	77%	31%	62%
	Pacific Islands	50%	75%	63%	63%	63%
	Southeast	48%	61%	78%	43%	48%
	West	60%	40%	60%	60%	20%
ESF	ESF #1	86%	71%	100%	29%	29%
	ESF #2	50%	100%	75%	75%	75%
	ESF #3	71%	82%	88%	29%	71%
	ESF #4	50%	100%	100%		
	ESF #5	56%	89%	78%	44%	44%
	ESF #6	25%	100%	75%	75%	75%
	ESF #7	75%	75%	75%	50%	50%
	ESF #8	50%	100%	100%		
	ESF #9	80%	60%	100%	20%	20%
	ESF #10	78%	74%	96%	44%	74%
	ESF #11		100%	100%		
	ESF #12	33%	67%	100%	33%	33%
	ESF #13	50%	67%	83%	50%	33%
	ESF #14			100%		
	ESF #15		100%	100%	100%	100%

Q7_1 Based on the following list of best practices, please select each practice you used during the 2020 hurricane season. (Select all that apply)

		Temporarily halted routine field operations	Updated response methods (i.e., remote response, minimize on-scene personnel, limit duration of response)	Other	N
OVERALL		67%	61%	5%	96
Line Office	NESDIS				1
	NMFS	100%			1
	NOS	83%	71%	4%	48
	NWS	33%	67%	50%	6
	OAR	100%	100%		1
	OMAO	67%	67%		3
Org or Agency Type	County or Municipal	67%	67%		3
	NOAA	79%	70%	4%	47
	Other Federal	47%	47%	12%	17
	Other Type	67%	33%		3
	State or Territory	50%	38%		16
Region	Alaska	33%	33%	33%	3
	Caribbean	59%	53%	18%	17
	Gulf of Mexico	67%	70%	10%	30
	Mid-Atlantic	65%	53%	6%	17
	National	70%	63%	7%	27
	Northeast	77%	62%	8%	13
	Pacific Islands	50%	50%	13%	8
	Southeast	52%	65%	17%	23
	West	40%	40%	20%	5
ESF	ESF #1	71%	86%	14%	7
	ESF #2	25%	50%		4
	ESF #3	76%	76%	6%	17
	ESF #4		50%	50%	2
	ESF #5	56%	56%	11%	9
	ESF #6	25%	50%		4
	ESF #7	50%	50%	25%	4
	ESF #8		50%	50%	2
	ESF #9	60%	60%	20%	5
	ESF #10	85%	85%	7%	27
	ESF #11				1
	ESF #12	67%	67%		3
	ESF #13	50%	67%	17%	6
	ESF #14	100%	100%		1
	ESF #15	100%	100%		2

Q7_2 Based on the following list of best practices, please select if you intend to use that best practice in the 2021 hurricane season. (Select all that apply)

		Changed response and recovery activities for field deployments	Changed response and recovery activities in a command post(s)	Conducted risk assessment prior to each deployment	Developed and used new training for staff to respond during a pandemic (i.e., tabletop exercise)
OVERALL		45%	32%	59%	38%
Line Office	NESDIS				
	NMFS	100%			
	NOS	54%	40%	77%	44%
	NWS	67%	17%		17%
	OAR			100%	100%
	OMAO	33%	33%	67%	67%
Org or Agency Type	County or Municipal	100%	67%	33%	67%
	NOAA	47%	30%	68%	43%
	Other Federal	29%	29%	47%	29%
	Other Type	33%	33%	67%	
	State or Territory	25%	25%	50%	25%
Region	Alaska	33%		33%	33%
	Caribbean	53%	47%	65%	41%
	Gulf of Mexico	53%	27%	53%	33%
	Mid-Atlantic	41%	29%	65%	41%
	National	44%	33%	63%	41%
	Northeast	23%	15%	69%	31%
	Pacific Islands	50%	38%	50%	50%
	Southeast	35%	17%	52%	26%
	West	60%	20%	40%	40%
ESF	ESF #1	57%	29%	71%	29%
	ESF #2	25%	25%	50%	75%
	ESF #3	53%	47%	82%	59%
	ESF #4	50%			
	ESF #5	44%	33%	56%	56%
	ESF #6	25%	25%	50%	75%
	ESF #7	25%	25%	50%	25%
	ESF #8	50%			
	ESF #9	40%	20%	60%	20%
	ESF #10	59%	52%	81%	44%
	ESF #11				
	ESF #12	67%	67%	33%	67%
	ESF #13	50%	17%	33%	33%
	ESF #14				
	ESF #15	100%	50%	100%	50%

Q7_2 Based on the following list of best practices, please select if you intend to use that best practice in the 2021 hurricane season. (Select all that apply)

		Developed criteria for deployments in a pandemic	Enhanced communication protocols (for before, during, and post events)	Minimize onscene personnel	Re-assigned tasks to employees (due to limited staff, COVID-19 high risk)	Staff were given discretion as to whether or not to deploy/respond
OVERALL		55%	65%	67%	32%	54%
Line Office	NESDIS					
	NMFS			100%	100%	
	NOS	63%	75%	75%	38%	65%
	NWS	50%	83%	33%	17%	33%
	OAR	100%	100%	100%		100%
	OMAO	100%		67%	33%	
Org or Agency Type	County or Municipal	33%	33%	67%	33%	33%
	NOAA	62%	66%	74%	34%	62%
	Other Federal	53%	59%	59%	12%	41%
	Other Type	33%	100%	33%	33%	67%
	State or Territory	38%	56%	56%	38%	50%
Region	Alaska	33%	67%	67%	67%	33%
	Caribbean	65%	65%	71%	29%	35%
	Gulf of Mexico	53%	63%	63%	33%	47%
	Mid-Atlantic	65%	53%	82%	53%	47%
	National	56%	63%	67%	41%	59%
	Northeast	62%	62%	77%	23%	62%
	Pacific Islands	38%	88%	63%	63%	63%
	Southeast	48%	57%	70%	30%	48%
	West	40%	40%	60%	40%	20%
ESF	ESF #1	86%	71%	71%	14%	43%
	ESF #2	50%	100%	50%	75%	50%
	ESF #3	76%	82%	76%	24%	71%
	ESF #4	50%	100%			50%
	ESF #5	56%	89%	67%	33%	33%
	ESF #6	25%	100%	50%	75%	75%
	ESF #7	50%	75%	50%	25%	25%
	ESF #8	50%	100%			50%
	ESF #9	80%	60%	40%	20%	40%
	ESF #10	74%	74%	81%	30%	74%
	ESF #11		100%			
	ESF #12	33%	67%	67%	33%	33%
	ESF #13	50%	67%	50%	33%	50%
	ESF #14					
	ESF #15	50%	100%	100%	50%	100%

Q7_2 Based on the following list of best practices, please select if you intend to use that best practice in the 2021 hurricane season. (Select all that apply)

		Temporarily halted routine field operations	Updated response methods (i.e., remote response, minimize on-scene personnel, limit duration of response)	Other	N
OVERALL		43%	57%	7%	96
Line Office	NESDIS				1
	NMFS				1
	NOS	54%	69%	6%	48
	NWS	17%	67%	50%	6
	OAR		100%		1
	OMAO		67%		3
Org or Agency Type	County or Municipal	67%	67%		3
	NOAA	43%	68%	6%	47
	Other Federal	35%	41%	12%	17
	Other Type	67%	33%	33%	3
	State or Territory	44%	25%		16
Region	Alaska		33%	33%	3
	Caribbean	41%	53%	24%	17
	Gulf of Mexico	33%	60%	10%	30
	Mid-Atlantic	41%	59%	12%	17
	National	44%	59%	7%	27
	Northeast	46%	62%	8%	13
	Pacific Islands	38%	50%	13%	8
	Southeast	17%	57%	17%	23
	West		40%	20%	5
ESF	ESF #1	29%	86%	14%	7
	ESF #2		50%		4
	ESF #3	47%	76%	6%	17
	ESF #4		50%	50%	2
	ESF #5	22%	56%	11%	9
	ESF #6	25%	50%		4
	ESF #7		50%	25%	4
	ESF #8		50%	50%	2
	ESF #9	20%	60%	20%	5
	ESF #10	56%	81%	7%	27
	ESF #11				1
	ESF #12	67%	67%		3
	ESF #13	33%	67%	17%	6
	ESF #14				1
	ESF #15	50%	100%		2

Q8 Do you know how to work through FEMA to get access to NOAA and other federal agency expertise?

		Yes	No	N
OVERALL		54%	46%	90
Line Office	NESDIS	100%		1
	NMFS		100%	1
	NOS	47%	53%	43
	NWS	50%	50%	6
	OAR	100%		1
	OMAO	67%	33%	3
Org or Agency Type	County or Municipal	67%	33%	3
	NOAA	48%	52%	42
	Other Federal	76%	24%	17
	Other Type	33%	67%	3
	State or Territory	53%	47%	15
Region	Alaska	33%	67%	3
	Caribbean	47%	53%	17
	Gulf of Mexico	52%	48%	29
	Mid-Atlantic	44%	56%	16
	National	61%	39%	23
	Northeast	54%	46%	13
	Pacific Islands	63%	38%	8
	Southeast	64%	36%	22
	West	40%	60%	5
ESF	ESF #1	43%	57%	7
	ESF #2	50%	50%	4
	ESF #3	71%	29%	17
	ESF #4	50%	50%	2
	ESF #5	67%	33%	9
	ESF #6	75%	25%	4
	ESF #7	50%	50%	4
	ESF #8	50%	50%	2
	ESF #9	60%	40%	5
	ESF #10	52%	48%	27
	ESF #11	100%		1
	ESF #12	100%		3
	ESF #13	50%	50%	6
	ESF #14	100%		1
	ESF #15	100%		2

Q9 Do you have a Mission Essential Function (MEF) or Emergency Support Function (ESF) role in hurricane response?

		Yes	No	N
OVERALL		47%	53%	92
Line Office	NESDIS		100%	1
	NMFS		100%	1
	NOS	50%	50%	44
	NWS	33%	67%	6
	OAR	100%		1
	OMAO	67%	33%	3
Org or Agency Type	County or Municipal	67%	33%	3
	NOAA	58%	42%	43
	Other Federal	35%	65%	17
	Other Type	33%	67%	3
	State or Territory	31%	69%	16
Region	Alaska	67%	33%	3
	Caribbean	47%	53%	17
	Gulf of Mexico	50%	50%	30
	Mid-Atlantic	38%	63%	16
	National	58%	42%	24
	Northeast	54%	46%	13
	Pacific Islands	50%	50%	8
	Southeast	48%	52%	23
	West	40%	60%	5
ESF	ESF #1	100%		7
	ESF #2	100%		4
	ESF #3	100%		17
	ESF #4	100%		2
	ESF #5	100%		9
	ESF #6	100%		4
	ESF #7	100%		4
	ESF #8	100%		2
	ESF #9	100%		5
	ESF #10	100%		27
	ESF #11	100%		1
	ESF #12	100%		3
	ESF #13	100%		6
	ESF #14	100%		1
	ESF #15	100%		2

Q10 Please select the ESF's you work under.

		ESF #1: Transportation	ESF #2: Communications	ESF #3: Public Works and Engineering	ESF #4: Firefighting	ESF #5: Information and Planning
OVERALL		16%	9%	40%	5%	21%
Line Office	NOS	14%	5%	41%		18%
	NWS	50%		50%	50%	50%
	OAR					
	OMAO	50%				
Org or Agency Type	County or Municipal			50%		
	NOAA	28%	12%	36%	8%	20%
	Other Federal			50%		17%
	Other Type					
	State or Territory			40%		20%
Region	Alaska		50%			100%
	Caribbean	25%	25%	13%	13%	50%
	Gulf of Mexico	13%	7%	27%	7%	20%
	Mid-Atlantic	33%	17%			33%
	National	21%	14%	29%		29%
	Northeast	29%	14%	29%		29%
	Pacific Islands		50%	50%		75%
	Southeast	27%	18%	27%	9%	36%
	West		50%			100%
ESF	ESF #1	100%	14%	43%	29%	29%
	ESF #2	25%	100%	25%	25%	100%
	ESF #3	18%	6%	100%	6%	18%
	ESF #4	100%	50%	50%	100%	50%
	ESF #5	22%	44%	33%	11%	100%
	ESF #6	25%	75%	25%	25%	75%
	ESF #7	50%	50%	25%	25%	75%
	ESF #8	100%	50%	50%	100%	50%
	ESF #9	80%	20%	60%	40%	20%
	ESF #10	19%	4%	44%	7%	11%
	ESF #11	100%	100%		100%	100%
	ESF #12	33%	33%	33%	33%	33%
	ESF #13	50%	17%	33%	33%	33%
	ESF #14					
	ESF #15			100%		50%

Q10 Please select the ESF's you work under.

		ESF #6: Mass Care, Emergency Assistance, Temporary Housing, and Human Services	ESF #7: Logistics	ESF #8: Public Health and Medical Services	ESF #9: Search and Rescue	ESF #10: Oil and Hazardous Materials Response
OVERALL		9%	9%	5%	12%	63%
Line Office	NOS		9%		5%	68%
	NWS			50%	50%	100%
	OAR					
	OMAO				50%	50%
Org or Agency Type	County or Municipal	50%				50%
	NOAA	12%	8%	8%	16%	64%
	Other Federal		17%			67%
	Other Type					100%
	State or Territory				20%	40%
Region	Alaska	50%	50%			
	Caribbean	25%	25%	13%	25%	63%
	Gulf of Mexico	7%	7%	7%	13%	73%
	Mid-Atlantic	17%	33%		17%	67%
	National	14%	7%		7%	43%
	Northeast	14%	29%		14%	57%
	Pacific Islands	50%	50%			25%
	Southeast	18%	27%	9%	18%	55%
	West	50%	50%			
ESF	ESF #1	14%	29%	29%	57%	71%
	ESF #2	75%	50%	25%	25%	25%
	ESF #3	6%	6%	6%	18%	71%
	ESF #4	50%	50%	100%	100%	100%
	ESF #5	33%	33%	11%	11%	33%
	ESF #6	100%	25%	25%	25%	50%
	ESF #7	25%	100%	25%	25%	50%
	ESF #8	50%	50%	100%	100%	100%
	ESF #9	20%	20%	40%	100%	100%
	ESF #10	7%	7%	7%	19%	100%
	ESF #11	100%	100%	100%	100%	100%
	ESF #12	67%	33%	33%	33%	67%
	ESF #13	33%	33%	33%	33%	83%
	ESF #14					
	ESF #15	50%				100%

Q10 Please select the ESF's you work under.

		ESF #11: Agriculture and Natural Resources Annex	ESF #12: Energy	ESF #13: Public Safety and Security	ESF #14: Cross-Sector Business and Infrastructure	ESF #15: External Affairs	N
OVERALL		2%	7%	14%	2%	5%	43
Line Office	NOS					5%	22
	NWS			100%			2
	OAR						1
	OMAO			50%			2
Org or Agency Type	County or Municipal		100%	50%		50%	2
	NOAA	4%	4%	16%		4%	25
	Other Federal						6
	Other Type						1
	State or Territory				20%		5
Region	Alaska						2
	Caribbean	13%	13%	13%			8
	Gulf of Mexico		7%	13%			15
	Mid-Atlantic			17%			6
	National			7%			14
	Northeast			14%			7
	Pacific Islands		25%	25%		25%	4
	Southeast	9%	9%	18%	9%	9%	11
	West						2
ESF	ESF #1	14%	14%	43%			7
	ESF #2	25%	25%	25%			4
	ESF #3		6%	12%		12%	17
	ESF #4	50%	50%	100%			2
	ESF #5	11%	11%	22%		11%	9
	ESF #6	25%	50%	50%		25%	4
	ESF #7	25%	25%	50%			4
	ESF #8	50%	50%	100%			2
	ESF #9	20%	20%	40%			5
	ESF #10	4%	7%	19%		7%	27
	ESF #11	100%	100%	100%			1
	ESF #12	33%	100%	67%		33%	3
	ESF #13	17%	33%	100%		17%	6
	ESF #14				100%		1
	ESF #15		50%	50%		100%	2

Q11_1 Which of the following do you anticipate as challenges for the 2021 hurricane season? (Select all that apply)

		Access to funding to support hurricane response efforts, including additional requirements due to the pandemic	Agency COVID-19 guidelines and rules differ from state to state	Being able to address impacts to tribal, territorial, state and/or federal trust resources	Complacency of others to follow COVID-19 safety guidelines (PPE, social distance, personal hygiene)
OVERALL		25%	47%	26%	58%
Line Office	NESDIS				
	NMFS				
	NOS	29%	60%	27%	69%
	NWS		50%		33%
	OAR				
	OMAO	33%	67%	67%	33%
Org or Agency Type	County or Municipal	33%	33%	67%	67%
	NOAA	23%	58%	23%	63%
	Other Federal	18%	41%	29%	59%
	Other Type	33%	33%		100%
	State or Territory	25%	13%	19%	38%
Region	Alaska		33%		33%
	Caribbean	24%	41%	35%	47%
	Gulf of Mexico	24%	52%	34%	55%
	Mid-Atlantic	18%	47%	24%	71%
	National	29%	50%	17%	58%
	Northeast	23%	54%	31%	62%
	Pacific Islands	25%	38%	38%	38%
	Southeast	9%	43%	26%	52%
	West		20%	20%	20%
ESF	ESF #1	57%	71%	43%	86%
	ESF #2	50%	25%		50%
	ESF #3	35%	59%	29%	65%
	ESF #4				50%
	ESF #5	33%	44%		44%
	ESF #6	25%	50%	25%	75%
	ESF #7	25%	25%		25%
	ESF #8				50%
	ESF #9	40%	40%	40%	60%
	ESF #10	27%	69%	42%	81%
	ESF #11				
	ESF #12	33%	33%	67%	67%
	ESF #13		67%	17%	50%
	ESF #14				
	ESF #15		100%	50%	100%

Q11_1 Which of the following do you anticipate as challenges for the 2021 hurricane season? (Select all that apply)

		Continuity of Operations Planning (COOP)	Coordinating deployment logistics (i.e., lodging, travel, testing) and response efforts with partners	Coordination with and access to federal and/or state partner programs, representatives, support or services	Establishing response guidance (on scene vs remote support)
OVERALL		23%	40%	26%	35%
Line Office	NESDIS				
	NMFS				
	NOS	22%	53%	38%	38%
	NWS	33%			50%
	OAR				
	OMAO	33%	33%	33%	33%
Org or Agency Type	County or Municipal	67%	33%		67%
	NOAA	12%	47%	35%	35%
	Other Federal	18%	35%	24%	24%
	Other Type	67%	33%		33%
	State or Territory	25%	31%	6%	31%
Region	Alaska			33%	
	Caribbean	41%	35%	35%	47%
	Gulf of Mexico	21%	38%	34%	41%
	Mid-Atlantic	24%	41%	29%	35%
	National	17%	46%	29%	21%
	Northeast	31%	46%	46%	31%
	Pacific Islands	25%	25%	25%	25%
	Southeast	13%	35%	26%	26%
	West			20%	
ESF	ESF #1	29%	71%	57%	71%
	ESF #2	25%	25%	25%	
	ESF #3	18%	53%	24%	35%
	ESF #4				50%
	ESF #5	22%	33%	11%	22%
	ESF #6	25%	50%	25%	25%
	ESF #7	25%	25%	25%	25%
	ESF #8				50%
	ESF #9	40%	40%	40%	60%
	ESF #10	35%	69%	46%	58%
	ESF #11				
	ESF #12	67%	33%		67%
	ESF #13	33%	33%	17%	67%
	ESF #14		100%		
	ESF #15	50%	100%		100%

Q11_1 Which of the following do you anticipate as challenges for the 2021 hurricane season? (Select all that apply)

		Having enough qualified personnel to respond	How to keep your people safe and maintain access to adequate protection during response activities	Loss of partner relationships without face-to-face interactions	Maintaining facilities
OVERALL		39%	47%	39%	28%
Line Office	NESDIS				
	NMFS		100%		
	NOS	49%	58%	51%	29%
	NWS		33%	67%	17%
	OAR				
	OMAO	33%	67%	33%	33%
Org or Agency Type	County or Municipal	33%	33%		67%
	NOAA	37%	53%	47%	21%
	Other Federal	35%	24%	24%	35%
	Other Type		67%	33%	33%
	State or Territory	44%	25%	19%	31%
Region	Alaska		33%		
	Caribbean	41%	53%	35%	41%
	Gulf of Mexico	41%	45%	45%	28%
	Mid-Atlantic	41%	41%	35%	24%
	National	33%	50%	42%	13%
	Northeast	38%	54%	31%	38%
	Pacific Islands	38%	38%	13%	25%
	Southeast	22%	39%	30%	35%
	West		20%		
ESF	ESF #1	71%	71%	86%	29%
	ESF #2	25%	50%	25%	
	ESF #3	53%	47%	47%	6%
	ESF #4			100%	
	ESF #5	22%	56%	33%	11%
	ESF #6	25%	25%	25%	25%
	ESF #7	50%	50%	25%	25%
	ESF #8			100%	
	ESF #9	40%	40%	80%	20%
	ESF #10	58%	62%	65%	31%
	ESF #11			100%	
	ESF #12	33%	33%	33%	67%
	ESF #13	33%	50%	50%	33%
	ESF #14	100%	100%		
	ESF #15	50%	50%		50%

Q11_1 Which of the following do you anticipate as challenges for the 2021 hurricane season? (Select all that apply)

		Management of staff and other resource capacity	Managing the multiple aspects of pandemic related fatigue	Return to pre-storm operational activities/capacity	Staff safety during evacuations
OVERALL		48%	65%	40%	34%
Line Office	NESDIS				
	NMFS		100%		
	NOS	47%	73%	44%	44%
	NWS	33%	50%	50%	33%
	OAR	100%	100%		
	OMAO	67%	67%	33%	67%
Org or Agency Type	County or Municipal	67%	67%	67%	33%
	NOAA	44%	74%	35%	44%
	Other Federal	53%	47%	47%	24%
	Other Type	67%	100%		
	State or Territory	44%	50%	31%	13%
Region	Alaska	33%	67%		33%
	Caribbean	53%	71%	41%	35%
	Gulf of Mexico	52%	69%	41%	31%
	Mid-Atlantic	53%	76%	35%	41%
	National	42%	67%	38%	42%
	Northeast	69%	77%	38%	38%
	Pacific Islands	50%	50%	38%	25%
	Southeast	35%	48%	22%	39%
	West	40%	60%		20%
ESF	ESF #1	57%	100%	71%	71%
	ESF #2	50%	75%	25%	50%
	ESF #3	47%	71%	59%	29%
	ESF #4		100%	50%	
	ESF #5	44%	67%	44%	44%
	ESF #6	75%	100%	25%	50%
	ESF #7	25%	50%	50%	25%
	ESF #8		100%	50%	
	ESF #9	40%	80%	60%	40%
	ESF #10	58%	85%	62%	46%
	ESF #11		100%		
	ESF #12	67%	100%	67%	33%
	ESF #13	50%	67%	67%	33%
	ESF #14				
	ESF #15	50%	100%	100%	50%

Q11_1 Which of the following do you anticipate as challenges for the 2021 hurricane season? (Select all that apply)

		Unreliability or loss of utilities (power, internet, water, cell service)	Other	N
OVERALL		51%	2%	92
Line Office	NESDIS			1
	NMFS	100%		1
	NOS	58%	2%	45
	NWS	33%	17%	6
	OAR			1
	OMAO	33%		3
Org or Agency Type	County or Municipal	67%		3
	NOAA	53%	2%	43
	Other Federal	53%	6%	17
	Other Type	67%		3
	State or Territory	44%		16
Region	Alaska	67%		3
	Caribbean	59%	12%	17
	Gulf of Mexico	59%	3%	29
	Mid-Atlantic	53%		17
	National	50%	4%	24
	Northeast	54%		13
	Pacific Islands	63%		8
	Southeast	43%	9%	23
	West	40%		5
ESF	ESF #1	71%		7
	ESF #2	50%		4
	ESF #3	53%		17
	ESF #4	50%		2
	ESF #5	44%		9
	ESF #6	75%		4
	ESF #7	25%		4
	ESF #8	50%		2
	ESF #9	80%		5
	ESF #10	69%	4%	26
	ESF #11			1
	ESF #12	67%		3
	ESF #13	50%		6
	ESF #14			1
	ESF #15	50%		2

Q11_2 Have found ways to mitigate this challenge? (Select all that apply)

		Access to funding to support hurricane response efforts, including additional requirements due to the pandemic	Agency COVID-19 guidelines and rules differ from state to state	Being able to address impacts to tribal, territorial, state and/or federal trust resources	Complacency of others to follow COVID-19 safety guidelines (PPE, social distance, personal hygiene)
OVERALL		17%	16%	8%	13%
Line Office	NESDIS				
	NMFS				
	NOS	13%	9%	7%	4%
	NWS				
	OAR		100%		100%
	OMAO	33%	67%		33%
Org or Agency Type	County or Municipal	33%			
	NOAA	19%	14%	7%	9%
	Other Federal	24%	35%	12%	24%
	Other Type				33%
	State or Territory	19%	19%	13%	19%
Region	Alaska		33%		
	Caribbean	24%	35%	12%	35%
	Gulf of Mexico	17%	14%	10%	14%
	Mid-Atlantic	12%	12%		6%
	National	21%	17%	4%	4%
	Northeast		31%		15%
	Pacific Islands	13%	13%		
	Southeast	13%	13%		4%
	West	20%	40%		20%
ESF	ESF #1	14%	14%		
	ESF #2	25%			
	ESF #3	29%	29%	12%	12%
	ESF #4				
	ESF #5	33%	33%	11%	11%
	ESF #6	50%			
	ESF #7		25%		
	ESF #8				
	ESF #9	20%	20%	20%	20%
	ESF #10	15%	12%	12%	8%
	ESF #11				
	ESF #12	33%			
	ESF #13	17%	17%		
	ESF #14				
	ESF #15	50%			

Q11_2 Have found ways to mitigate this challenge? (Select all that apply)

		Continuity of Operations Planning (COOP)	Coordinating deployment logistics (i.e., lodging, travel, testing) and response efforts with partners	Coordination with and access to federal and/or state partner programs, representatives, support or services	Establishing response guidance (on scene vs remote support)
OVERALL		25%	14%	17%	24%
Line Office	NESDIS				
	NMFS				
	NOS	22%	9%	11%	27%
	NWS	17%			33%
	OAR	100%	100%		
	OMAO	33%	33%	33%	33%
Org or Agency Type	County or Municipal			33%	
	NOAA	23%	16%	16%	26%
	Other Federal	35%	24%	24%	24%
	Other Type				33%
	State or Territory	25%	13%	25%	13%
Region	Alaska	33%			67%
	Caribbean	24%	18%	29%	24%
	Gulf of Mexico	28%	17%	17%	34%
	Mid-Atlantic	35%	12%	18%	35%
	National	21%	8%	8%	33%
	Northeast	38%	23%	8%	38%
	Pacific Islands	25%		13%	25%
	Southeast	26%	9%	13%	30%
	West	40%	20%	20%	60%
ESF	ESF #1		29%	29%	29%
	ESF #2	50%			25%
	ESF #3	35%	18%	18%	29%
	ESF #4				
	ESF #5	56%	22%	22%	44%
	ESF #6	25%		25%	25%
	ESF #7	25%	25%	25%	50%
	ESF #8				
	ESF #9	20%	20%	20%	20%
	ESF #10	27%	15%	15%	38%
	ESF #11				
	ESF #12			33%	
	ESF #13	17%	17%	33%	33%
	ESF #14				
	ESF #15	50%		100%	

Q11_2 Have found ways to mitigate this challenge? (Select all that apply)

		Having enough qualified personnel to respond	How to keep your people safe and maintain access to adequate protection during response activities	Loss of partner relationships without face-to-face interactions	Maintaining facilities
OVERALL		26%	46%	20%	14%
Line Office	NESDIS				
	NMFS				
	NOS	27%	47%	16%	13%
	NWS	17%	17%	17%	
	OAR	100%			
	OMAO	33%	67%	33%	33%
Org or Agency Type	County or Municipal		67%	33%	
	NOAA	33%	49%	19%	14%
	Other Federal	18%	53%	29%	24%
	Other Type	33%	33%		
	State or Territory	25%	31%	25%	13%
Region	Alaska	33%	67%		
	Caribbean	24%	41%	18%	12%
	Gulf of Mexico	31%	59%	21%	17%
	Mid-Atlantic	18%	35%	18%	24%
	National	33%	58%	13%	8%
	Northeast	23%	46%	8%	23%
	Pacific Islands	13%	50%	13%	
	Southeast	22%	48%	13%	9%
	West	40%	60%	20%	20%
ESF	ESF #1	29%	57%	43%	
	ESF #2	25%	100%		
	ESF #3	24%	71%	41%	12%
	ESF #4		50%	50%	
	ESF #5	33%	100%	33%	
	ESF #6	25%	100%	25%	
	ESF #7		100%		
	ESF #8		50%	50%	
	ESF #9	20%	40%	40%	20%
	ESF #10	23%	65%	23%	8%
	ESF #11		100%		
	ESF #12		100%	33%	
	ESF #13		83%	33%	
	ESF #14	100%	100%		
	ESF #15		100%	100%	

Q11_2 Have found ways to mitigate this challenge? (Select all that apply)

		Management of staff and other resource capacity	Managing the multiple aspects of pandemic related fatigue	Return to pre-storm operational activities/capacity	Staff safety during evacuations
OVERALL		21%	13%	17%	27%
Line Office	NESDIS				
	NMFS				
	NOS	20%	13%	13%	22%
	NWS	17%	17%	17%	17%
	OAR				
	OMAO			33%	67%
Org or Agency Type	County or Municipal			33%	33%
	NOAA	16%	16%	14%	28%
	Other Federal	41%	24%	24%	41%
	Other Type			33%	
	State or Territory	19%	6%	19%	31%
Region	Alaska	33%		67%	
	Caribbean	24%	12%	29%	35%
	Gulf of Mexico	34%	17%	28%	21%
	Mid-Atlantic	18%	6%	29%	18%
	National	17%	8%	21%	42%
	Northeast	31%	8%	23%	
	Pacific Islands	13%		38%	13%
	Southeast	17%	9%	17%	13%
	West	20%		60%	20%
ESF	ESF #1			14%	29%
	ESF #2	25%	25%	25%	25%
	ESF #3	18%	12%	29%	29%
	ESF #4				
	ESF #5	33%	11%	56%	33%
	ESF #6	25%	25%	50%	50%
	ESF #7	25%		25%	
	ESF #8				
	ESF #9	20%	20%	20%	20%
	ESF #10	23%	12%	27%	19%
	ESF #11				
	ESF #12			33%	33%
	ESF #13	17%		33%	33%
	ESF #14	100%			
	ESF #15			50%	50%

Q11_2 Have found ways to mitigate this challenge? (Select all that apply)

		Unreliability or loss of utilities (power, internet, water, cell service)	Other	N
OVERALL		8%	3%	92
Line Office	NESDIS			1
	NMFS			1
	NOS	7%	2%	45
	NWS		17%	6
	OAR			1
	OMAO	33%		3
Org or Agency Type	County or Municipal		33%	3
	NOAA	9%		43
	Other Federal	18%	12%	17
	Other Type			3
	State or Territory			16
Region	Alaska		33%	3
	Caribbean	12%	12%	17
	Gulf of Mexico	14%	7%	29
	Mid-Atlantic	6%	6%	17
	National	8%	8%	24
	Northeast		8%	13
	Pacific Islands		25%	8
	Southeast	4%	9%	23
	West	20%	20%	5
ESF	ESF #1	14%		7
	ESF #2			4
	ESF #3	6%	6%	17
	ESF #4			2
	ESF #5	11%	11%	9
	ESF #6		25%	4
	ESF #7		25%	4
	ESF #8			2
	ESF #9			5
	ESF #10		4%	26
	ESF #11			1
	ESF #12		33%	3
	ESF #13		17%	6
	ESF #14			1
	ESF #15		50%	2

Q12_1 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - How to keep your people safe and maintain access to adequate protection (PPE, COVID-19 testing, vaccines) during response activities

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		29%	63%	7%	41
Line Office	NMFS		100%		1
	NOS	29%	67%	4%	24
	NWS	50%	50%		2
	OMAO		50%	50%	2
Org or Agency Type	County or Municipal		100%		1
	NOAA	23%	68%	9%	22
	Other Federal	25%	75%		4
	Other Type		100%		1
	State or Territory	75%	25%		4
Region	Alaska		100%		1
	Caribbean	44%	44%	11%	9
	Gulf of Mexico	31%	54%	15%	13
	Mid-Atlantic	33%	50%	17%	6
	National	8%	92%		12
	Northeast		83%	17%	6
	Pacific Islands	33%	67%		3
	Southeast	22%	67%	11%	9
	West		100%		1
ESF	ESF #1		80%	20%	5
	ESF #2		100%		2
	ESF #3	13%	75%	13%	8
	ESF #5		100%		5
	ESF #6		100%		1
	ESF #7		100%		2
	ESF #9		50%	50%	2
	ESF #10	38%	50%	13%	16
	ESF #12		100%		1
	ESF #13		100%		3
	ESF #14		100%		1
	ESF #15		100%		1

Q12_2 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Having enough qualified personnel to respond

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		29%	51%	20%	35
Line Office	NOS	23%	50%	27%	22
	OMAO		100%		1
Org or Agency Type	County or Municipal		100%		1
	NOAA	25%	38%	38%	16
	Other Federal	33%	50%	17%	6
	State or Territory	50%	50%		6
Region	Caribbean	71%	29%		7
	Gulf of Mexico	25%	50%	25%	12
	Mid-Atlantic		67%	33%	6
	National	25%	50%	25%	8
	Northeast		80%	20%	5
	Pacific Islands	33%	67%		3
	Southeast	20%	60%	20%	5
ESF	ESF #1	20%	20%	60%	5
	ESF #2		100%		1
	ESF #3	11%	56%	33%	9
	ESF #5		50%	50%	2
	ESF #6		100%		1
	ESF #7		50%	50%	2
	ESF #9	50%	50%		2
	ESF #10	33%	40%	27%	15
	ESF #12		100%		1
	ESF #13		50%	50%	2
	ESF #14		100%		1
	ESF #15		100%		1

Q12_3 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Access to funding to support hurricane response efforts, including additional requirements due to the pandemic

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		22%	65%	13%	23
Line Office	NOS	23%	62%	15%	13
	OMAO		100%		1
Org or Agency Type	County or Municipal		100%		1
	NOAA	20%	70%	10%	10
	Other Federal	33%	67%		3
	Other Type		100%		1
	State or Territory	25%	50%	25%	4
Region	Caribbean	50%	50%		4
	Gulf of Mexico	29%	71%		7
	Mid-Atlantic		33%	67%	3
	National	14%	71%	14%	7
	Northeast		100%		3
	Pacific Islands	50%	50%		2
	Southeast		100%		2
ESF	ESF #1		75%	25%	4
	ESF #2		100%		2
	ESF #3		83%	17%	6
	ESF #5		67%	33%	3
	ESF #6		100%		1
	ESF #7		100%		1
	ESF #9		100%		2
	ESF #10	14%	71%	14%	7
	ESF #12		100%		1

Q12_4 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Staff safety during evacuations

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		10%	57%	33%	30
Line Office	NOS	5%	68%	26%	19
	NWS			100%	2
	OMAO		50%	50%	2
Org or Agency Type	County or Municipal		100%		1
	NOAA		72%	28%	18
	Other Federal	25%	25%	50%	4
	State or Territory	50%	50%		2
Region	Alaska			100%	1
	Caribbean	17%	33%	50%	6
	Gulf of Mexico	33%	44%	22%	9
	Mid-Atlantic	17%	17%	67%	6
	National		50%	50%	10
	Northeast	20%	40%	40%	5
	Pacific Islands		50%	50%	2
	Southeast	11%	56%	33%	9
	West			100%	1
ESF	ESF #1		60%	40%	5
	ESF #2			100%	2
	ESF #3		60%	40%	5
	ESF #5		25%	75%	4
	ESF #6			100%	2
	ESF #7		100%		1
	ESF #9		50%	50%	2
	ESF #10	17%	58%	25%	12
	ESF #12		100%		1
	ESF #13		100%		2
	ESF #15		100%		1

Q12_5 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Continuity of Operations Planning (COOP)

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		20%	70%	10%	20
Line Office	NOS		100%		9
	NWS		50%	50%	2
	OMAO			100%	1
Org or Agency Type	County or Municipal		100%		2
	NOAA		80%	20%	5
	Other Federal		67%	33%	3
	Other Type		100%		1
	State or Territory	100%			4
Region	Caribbean	29%	43%	29%	7
	Gulf of Mexico	17%	67%	17%	6
	Mid-Atlantic	25%	50%	25%	4
	National		100%		4
	Northeast		67%	33%	3
	Pacific Islands		100%		2
	Southeast		67%	33%	3
ESF	ESF #1		50%	50%	2
	ESF #2		100%		1
	ESF #3		100%		3
	ESF #5		100%		2
	ESF #6		100%		1
	ESF #7		100%		1
	ESF #9		50%	50%	2
	ESF #10	11%	78%	11%	9
	ESF #12		100%		2
	ESF #13		100%		2
	ESF #15		100%		1

Q12_6 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Return to pre-storm operational activities/capacity

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		27%	62%	11%	37
Line Office	NOS	25%	70%	5%	20
	NWS		67%	33%	3
	OMAO			100%	1
Org or Agency Type	County or Municipal		50%	50%	2
	NOAA	27%	60%	13%	15
	Other Federal	13%	88%		8
	State or Territory	60%	40%		5
Region	Caribbean	43%	43%	14%	7
	Gulf of Mexico	17%	50%	33%	12
	Mid-Atlantic	33%	50%	17%	6
	National	33%	67%		9
	Northeast	40%	40%	20%	5
	Pacific Islands	33%	67%		3
	Southeast	40%	40%	20%	5
ESF	ESF #1	60%	20%	20%	5
	ESF #2		100%		1
	ESF #3	20%	80%		10
	ESF #4		100%		1
	ESF #5	25%	50%	25%	4
	ESF #6		100%		1
	ESF #7	50%	50%		2
	ESF #8		100%		1
	ESF #9	33%	33%	33%	3
	ESF #10	25%	56%	19%	16
	ESF #12		50%	50%	2
	ESF #13	25%	50%	25%	4
	ESF #15		100%		2

Q12_7 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Managing the multiple aspects of pandemic related fatigue

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		41%	50%	9%	58
Line Office	NMFS		100%		1
	NOS	52%	42%	6%	31
	NWS		67%	33%	3
	OAR		100%		1
	OMAO	50%	50%		2
Org or Agency Type	County or Municipal	50%	50%		2
	NOAA	42%	48%	10%	31
	Other Federal	25%	75%		8
	Other Type		100%		2
	State or Territory	50%	25%	25%	8
Region	Alaska		100%		2
	Caribbean	33%	67%		12
	Gulf of Mexico	45%	40%	15%	20
	Mid-Atlantic	42%	42%	17%	12
	National	44%	56%		16
	Northeast	44%	56%		9
	Pacific Islands	25%	75%		4
	Southeast	27%	73%		11
	West		100%		3
ESF	ESF #1	43%	43%	14%	7
	ESF #2		100%		3
	ESF #3	42%	50%	8%	12
	ESF #4		50%	50%	2
	ESF #5	17%	83%		6
	ESF #6		100%		4
	ESF #7	50%	50%		2
	ESF #8		50%	50%	2
	ESF #9	50%	25%	25%	4
	ESF #10	41%	50%	9%	22
	ESF #11		100%		1
	ESF #12	33%	67%		3
	ESF #13	25%	50%	25%	4
	ESF #15		100%		2

Q12_8 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Management of staff and other resource capacity

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		15%	66%	20%	41
Line Office	NOS	16%	63%	21%	19
	NWS		50%	50%	2
	OAR		100%		1
	OMAO		100%		2
Org or Agency Type	County or Municipal		100%		2
	NOAA	11%	68%	21%	19
	Other Federal	14%	71%	14%	7
	Other Type		100%		1
	State or Territory	29%	43%	29%	7
Region	Alaska		100%		1
	Caribbean	25%	63%	13%	8
	Gulf of Mexico	7%	67%	27%	15
	Mid-Atlantic		100%		8
	National	10%	70%	20%	10
	Northeast		88%	13%	8
	Pacific Islands	25%	50%	25%	4
	Southeast	13%	88%		8
	West		100%		2
ESF	ESF #1	25%	50%	25%	4
	ESF #2		100%		2
	ESF #3	38%	25%	38%	8
	ESF #5	25%	50%	25%	4
	ESF #6		100%		3
	ESF #7		100%		1
	ESF #9	50%	50%		2
	ESF #10	13%	53%	33%	15
	ESF #12		100%		2
	ESF #13		67%	33%	3
	ESF #15		100%		1

Q12_9 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Unreliability or loss of utilities (power, internet, water, cell service)

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		34%	50%	16%	44
Line Office	NMFS		100%		1
	NOS	21%	63%	17%	24
	NWS		50%	50%	2
	OMAO		100%		1
Org or Agency Type	County or Municipal	100%			2
	NOAA	9%	68%	23%	22
	Other Federal	25%	50%	25%	8
	Other Type		100%		1
	State or Territory	71%	29%		7
Region	Alaska		50%	50%	2
	Caribbean	33%	56%	11%	9
	Gulf of Mexico	18%	59%	24%	17
	Mid-Atlantic	25%	38%	38%	8
	National	25%	58%	17%	12
	Northeast	17%	50%	33%	6
	Pacific Islands	60%	20%	20%	5
	Southeast	20%	60%	20%	10
	West		50%	50%	2
ESF	ESF #1		40%	60%	5
	ESF #2	50%		50%	2
	ESF #3	22%	56%	22%	9
	ESF #4			100%	1
	ESF #5	50%		50%	4
	ESF #6	67%		33%	3
	ESF #7			100%	1
	ESF #8			100%	1
	ESF #9		75%	25%	4
	ESF #10	22%	67%	11%	18
	ESF #12	100%			2
	ESF #13	33%		67%	3
	ESF #15	100%			1

Q12_10 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Maintaining facilities

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		15%	69%	15%	26
Line Office	NOS	8%	92%		13
	NWS			100%	1
	OMAO			100%	1
Org or Agency Type	County or Municipal		50%	50%	2
	NOAA		78%	22%	9
	Other Federal		83%	17%	6
	Other Type		100%		1
	State or Territory	60%	40%		5
Region	Caribbean	43%	29%	29%	7
	Gulf of Mexico		75%	25%	8
	Mid-Atlantic		50%	50%	4
	National		100%		3
	Northeast		60%	40%	5
	Pacific Islands	50%	50%		2
	Southeast		75%	25%	8
ESF	ESF #1			100%	2
	ESF #3		100%		1
	ESF #5	100%			1
	ESF #6		100%		1
	ESF #7			100%	1
	ESF #9			100%	1
	ESF #10		75%	25%	8
	ESF #12		50%	50%	2
	ESF #13		50%	50%	2
	ESF #15		100%		1

Q12_11 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Being able to address impacts to tribal, territorial, state and/or federal trust resources

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		29%	46%	25%	24
Line Office	NOS	25%	58%	17%	12
	OMAO			100%	2
Org or Agency Type	County or Municipal		50%	50%	2
	NOAA		60%	40%	10
	Other Federal	20%	60%	20%	5
	State or Territory	100%			3
Region	Caribbean	33%	33%	33%	6
	Gulf of Mexico	20%	40%	40%	10
	Mid-Atlantic	25%	25%	50%	4
	National	25%	50%	25%	4
	Northeast	25%	25%	50%	4
	Pacific Islands	67%	33%		3
	Southeast	17%	50%	33%	6
	West			100%	1
ESF	ESF #1		33%	67%	3
	ESF #3		80%	20%	5
	ESF #6		100%		1
	ESF #9		50%	50%	2
	ESF #10	9%	64%	27%	11
	ESF #12		50%	50%	2
	ESF #13		100%		1
	ESF #15		100%		1

Q12_12 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Establishing response guidance (on scene vs remote support)

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		19%	47%	34%	32
Line Office	NOS	18%	59%	24%	17
	NWS			100%	3
	OMAO			100%	1
Org or Agency Type	County or Municipal		100%		2
	NOAA	13%	47%	40%	15
	Other Federal		75%	25%	4
	Other Type			100%	1
	State or Territory	60%		40%	5
Region	Caribbean	38%	25%	38%	8
	Gulf of Mexico	17%	33%	50%	12
	Mid-Atlantic		50%	50%	6
	National		80%	20%	5
	Northeast		75%	25%	4
	Pacific Islands	50%	50%		2
	Southeast	17%	67%	17%	6
ESF	ESF #1		40%	60%	5
	ESF #3		67%	33%	6
	ESF #4			100%	1
	ESF #5		50%	50%	2
	ESF #6		100%		1
	ESF #7		100%		1
	ESF #8			100%	1
	ESF #9		33%	67%	3
	ESF #10	13%	53%	33%	15
	ESF #12		100%		2
	ESF #13		50%	50%	4
	ESF #15		100%		2

Q12_13 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Agency COVID-19 guidelines and rules differ from state to state

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		20%	54%	27%	41
Line Office	NOS	20%	60%	20%	25
	NWS	33%	33%	33%	3
	OMAO		100%		2
Org or Agency Type	County or Municipal			100%	1
	NOAA	13%	65%	22%	23
	Other Federal		57%	43%	7
	Other Type			100%	1
	State or Territory	100%			2
Region	Alaska		100%		1
	Caribbean	14%	57%	29%	7
	Gulf of Mexico	20%	53%	27%	15
	Mid-Atlantic	14%	86%		7
	National	8%	83%	8%	12
	Northeast		86%	14%	7
	Pacific Islands	33%	33%	33%	3
	Southeast	11%	67%	22%	9
	West		100%		1
ESF	ESF #1		80%	20%	5
	ESF #2		100%		1
	ESF #3	20%	50%	30%	10
	ESF #5	25%	50%	25%	4
	ESF #6		50%	50%	2
	ESF #7		100%		1
	ESF #9		100%		2
	ESF #10	17%	61%	22%	18
	ESF #12			100%	1
	ESF #13		50%	50%	4
	ESF #15	50%		50%	2

Q12_14 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Complacency of others to follow COVID-19 safety guidelines (PPE, social distance, personal hygiene)

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		36%	52%	12%	50
Line Office	NOS	46%	43%	11%	28
	NWS		50%	50%	2
	OMAO	100%			1
Org or Agency Type	County or Municipal	50%		50%	2
	NOAA	44%	40%	16%	25
	Other Federal		90%	10%	10
	Other Type		100%		2
	State or Territory	50%	50%		6
Region	Alaska		100%		1
	Caribbean	38%	63%		8
	Gulf of Mexico	44%	38%	19%	16
	Mid-Atlantic	45%	55%		11
	National	29%	64%	7%	14
	Northeast	29%	71%		7
	Pacific Islands	33%	33%	33%	3
	Southeast	36%	55%	9%	11
	West		100%		1
ESF	ESF #1	50%	17%	33%	6
	ESF #2		100%		2
	ESF #3	55%	18%	27%	11
	ESF #4			100%	1
	ESF #5	50%	50%		4
	ESF #6		67%	33%	3
	ESF #7		100%		1
	ESF #8			100%	1
	ESF #9	67%		33%	3
	ESF #10	48%	43%	10%	21
	ESF #12	50%		50%	2
	ESF #13		33%	67%	3
	ESF #15	50%		50%	2

Q12_15 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Coordinating deployment logistics (i.e., lodging, travel, testing) and response efforts with partners

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		36%	47%	17%	36
Line Office	NOS	35%	52%	13%	23
	OMAO	100%			1
Org or Agency Type	County or Municipal			100%	1
	NOAA	32%	53%	16%	19
	Other Federal	17%	83%		6
	Other Type			100%	1
	State or Territory	40%	40%	20%	5
Region	Caribbean	67%	33%		6
	Gulf of Mexico	45%	36%	18%	11
	Mid-Atlantic	67%	33%		6
	National	18%	55%	27%	11
	Northeast	67%	33%		6
	Pacific Islands	50%		50%	2
	Southeast	50%	50%		8
ESF	ESF #1	60%	40%		5
	ESF #2			100%	1
	ESF #3	33%	44%	22%	9
	ESF #5		67%	33%	3
	ESF #6			100%	2
	ESF #7	100%			1
	ESF #9	100%			2
	ESF #10	44%	44%	11%	18
	ESF #12			100%	1
	ESF #13	50%		50%	2
	ESF #14		100%		1
	ESF #15		50%	50%	2

Q12_16 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Coordination with and access to federal and/or state partner programs, representatives, support or services

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		22%	65%	13%	23
Line Office	NOS	19%	63%	19%	16
	OMAO		100%		1
Org or Agency Type	NOAA		79%	21%	14
	Other Federal	25%	75%		4
	State or Territory	100%			1
Region	Alaska		100%		1
	Caribbean	17%	83%		6
	Gulf of Mexico	20%	50%	30%	10
	Mid-Atlantic	20%	80%		5
	National	14%	86%		7
	Northeast	17%	83%		6
	Pacific Islands	50%	50%		2
	Southeast	20%	80%		5
	West		100%		1
ESF	ESF #1		100%		4
	ESF #2		100%		1
	ESF #3		100%		4
	ESF #5		100%		1
	ESF #6		100%		1
	ESF #7		100%		1
	ESF #9		100%		2
	ESF #10	8%	83%	8%	12
	ESF #13		100%		1

Q12_17 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? - Loss of partner relationships without face-to-face interactions

		Substantial Challenge	Moderate Challenge	Minor Challenge	N
OVERALL		33%	44%	22%	36
Line Office	NOS	26%	43%	30%	23
	NWS	50%	25%	25%	4
	OMAO		100%		1
Org or Agency Type	NOAA	25%	45%	30%	20
	Other Federal	50%	50%		4
	Other Type			100%	1
	State or Territory	67%	33%		3
Region	Caribbean	50%	50%		6
	Gulf of Mexico	15%	54%	31%	13
	Mid-Atlantic	17%	67%	17%	6
	National	40%	30%	30%	10
	Northeast	25%	75%		4
	Pacific Islands		100%		1
	Southeast	29%	71%		7
ESF	ESF #1		67%	33%	6
	ESF #2		100%		1
	ESF #3	25%	50%	25%	8
	ESF #4		50%	50%	2
	ESF #5		100%		3
	ESF #6		100%		1
	ESF #7		100%		1
	ESF #8		50%	50%	2
	ESF #9		75%	25%	4
	ESF #10	24%	53%	24%	17
	ESF #11		100%		1
	ESF #12		100%		1
	ESF #13		67%	33%	3

Appendix B

Q1: What is the name of your organization/agency (fill in the blank)? (e.g., NOAA, Texas General Land Office (TXGLO), American Red Cross).

- Alabama Department of Conservation and Natural Resources, State Lands Division, Coastal Section
- American Samoa Department of Commerce/Coastal Zone Management Program
- Apalachicola National Estuarine Research Reserve
- Caribbean Tsunami Warning Program
- City and County of Honolulu Department of Emergency Management (Hawaii)
- CNMI Division of Coastal Resources Management (DCRM)
- Delaware Department of Natural Resources and Environmental Control
- Delaware/DNREC, Delaware National Estuarine Research Reserve
- Department of Planning and Natural Resources Division of Coastal Zone Management (DPNR-CZM)
- Dept of Interior
- EPA
- FEMA
- FEMA
- Florida Coastal Management Program
- Florida DEP- Rookery Bay NERR
- Florida Department of Environmental Protection
- Georgia Emergency Management and Homeland Security Agency
- Grand Bay NERR / MS Department of Marine Resources
- Guana Tolomato Matanzas National Estuarine Research Reserve
- IOOS CARICOOS
- LA Department of Natural Resources
- LA Department of Natural Resources, Office of Coastal Management
- Louisiana Department of Environmental Quality
- Maryland Sea Grant
- Mission-Aransas National Estuarine Research Reserve
- National Hurricane Center/Tropical Analysis and Forecast Branch
- NC Wildlife Resources Commission
- NERRS
- New York State Department of State
- NJ Sea Grant
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- NOAA / Flower Garden Banks NMS
- NOAA National Geodetic Survey
- NOAA NOS Office for Coastal Management
- NOAA NWS
- NOAA OCM
- NOAA, National Weather Service, WFO Key West, Florida
- NOAA, NOS, National Centers for Coastal Ocean Science
- NOAA, NOS, Office of Coast Survey, Navigation Services Division
- NOAA/DOC
- NOAA/NOS/Stellwagen Bank NMS
- NOAA/ORR/Marine Debris Program
- NWS
- Office for Coastal Management
- OR&R
- para la naturaleza
- Red Panamericana de Bioética y Comunicación
- Research Planning, Inc.
- Richardson’s Bay Regional Agency
- Rookery Bay NERR
- Sapelo Island NERR (in GA Dept. Nat. Resources, Wildlife Res. Division)
- Sea Grant Puerto Rico
- South Carolina Department of Health and Environmental Control, Office of Ocean and Coastal Resource Management
- Texas Sea Grant
- United States

- University of Hawaii Sea Grant College Program
- University of Puerto Rico, Río Piedras
- US EPA Region 2
- US Fish and Wildlife Service
- US Virgin Islands Territorial Emergency Management Agency (VITEMA)
- USACE
- Virginia Institute of Marine Science/Chesapeake Bay NERR
- Wells National Estuarine Research Reserve
- Woods Hole Sea Grant

Q7 Based on the following list of best practices, please select each practice you used during the 2020 hurricane season and if you intend to use that best practice in the 2021 hurricane season. Other – Please Specify

- extensive virtual deployments
- Frequent check in with response partners to ensure they are getting the support needed via remote methods
- More virtual decision support including from home/telework
- Offer Risk Communication training
- Plan for Acquisition Support for after hours and week-ends
- We don't do response and recovery

Q11 Which of the following do you anticipate as challenges for the 2021 hurricane season? Other – Please Specify

- COVID Test kits
- full training support for response partners
- We don't do response and recovery activities

Q12 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season? Other – Please Specify

- loss or limited resources to conduct work from home

Q13 Is there a specific topic you would like addressed in the upcoming NOS Hurricane Preparedness Summit?

- Emergency preparedness for residents and businesses 2. Strengthening homes against hurricanes (e.g., window protection options, hurricane clips and foundation ties)
- 1.How to better position NOS offices to receive mission assignments from FEMA. 2. Explanation of PSMAs and how to use effectively. 3. Increased coordination between ESF-3 and ESF-10 related to debris removal and disposal. 4. Virtual vs. in-person deployment decision matrix
- Benefits of being response individuals being COVID-19 vaccinated by the start of hurricane season 2021.
- Better joint reviews, planning, coordination, training and response with all response partners. Internal and external. ie, USCG, EPA, NOAA, DOI, FEMA, States, others to improve consistency, understand challenges from each partner that may affect response, review all lessons learned and recommend improvements, establish better policy and guidance that will enable the Federal and State partners to improve processes, support each other more effectively, and produce more efficient response that results in the specified objectives for each ESF being addressed.
- COVID - shifting situation and differences in agency approaches and personal comfort/risk perception by responders. In 2020 most agencies and personnel took a very conservative

approach. This year I believe there will be a much broader range of risk tolerance. How will all that "gell" during a response?

- Ensuring/promoting/mandating employees have a written Emergency Family Plan (ready.gov/plan) so their families are safe during deployment.
- How to work the hurricane and COVID-19 compound events in higher education institutions.
- I am interested in coordination, how to facilitate data and information be available or managed by different NOAA entities to support decision support for US landfalling or threatening events vs International events for which we may have data, information. But, I think this is part of another conversation.
- Just uncertainty as far as COVID status and where hurricanes will hit. Will make all the difference. And my answers apply to a forecaster that occasionally deploys to EOCs and ventures into the field for damage surveys. Will be different than other NOAA folks.
- Kudos to the Kate, Charlie, Jessica and others for FY 20 Hurricane Support and all the communications and training they do. And COVID-19 reporting and response which was new this year.
- Measuring impact and mitigation options due to a major interruption or loss of IT connectivity due to natural events (storms, etc) or man induced (intentional cyber breaches).
- Not specific to our situation, but challenges arising from transitions back to pre-pandemic operations
- Not that I can think of at this time.
- Policy related to vaccination status in mitigation and planning strategies.
- Responding to multiple hurricanes in the same locations/same regions during a pandemic
- Risk Communication, community education and the role of local organizations in preparedness and response
- The likelihood of another busy hurricane season.
- The RBRA (Richardson’s Bay Regional Agency) is located in San Francisco Bay, CA. We don’t get much in the way of hurricanes here. :)
- Yes, I think it is important to have an update on COVID-19 by both the U.S. Public Health Officers supporting NOAA, as well as senior leaders, especially concerning reconstitution, return to onsite work, and travel.

Appendix C

2021 Hurricane Summit - Pre-Summit Survey

Start of Block: INTRO BLOCK

INTRO Introduction

Last year, the Atlantic Hurricane Season set records for the most named storms and the highest number of landfalls. The COVID-19 Pandemic forced us to plan and respond differently. That was last year. The 2021 Hurricane Season is quickly approaching, and while we may have many of the same challenges this year, there may be new challenges as well. Again this year, NOAA will conduct a virtual hurricane preparedness summit focused on what we call PMI - Personnel (people), Mission, and Infrastructure to enhance our readiness and ability to support our state and federal partners. Critical to this effort is assessing what we've collectively learned and identifying new challenges as everyone adjusts annual plans ahead of peak hurricane season.

As a valued member of the response, preparedness and recovery community, you were identified by a member of the planning committee to provide feedback to help shape this year's summit. Please provide the NOS Hurricane Preparedness Summit planning committee and the 2021 participants in the Hurricane Summit (June 21 &23) with your thoughts and insights. Thank you very much for your past participation and for again assisting us this year. Best!

Charlie Henry

Director, NOAA's Gulf of Mexico Disaster Response Center

Mark the dates for the 2021 NOS Hurricane Preparedness Summit.
If you received this email, you will be receiving a registration invite in the very near future. The 2021 NOS Hurricane Preparedness Summit is planned as a virtual event between 1:00 and 5:00 Eastern Time on 21 and 23 June, 2021.

End of Block: INTRO BLOCK

Start of Block: General Questions

Q1 What is the name of your organization/agency (fill in the blank)? (e.g., NOAA, Texas General Land Office (TXGLO), American Red Cross).

Display This Question:

If Q1 = 1

Q2 If you work or are a contractor for NOAA, select your appropriate line office:

- National Environmental Satellite, Data, and Information Service (NESDIS) (1)
- National Marine Fisheries Service (NMFS) (2)
- National Ocean Service (NOS) (3)
- National Weather Service (NWS) (4)
- Office of Marine & Aviation Operations (OMAO) (5)
- Office of Oceanic & Atmospheric Research (OAR) (6)
- Not Applicable (7)

Page Break

Q3 What region or state do you represent?

(*Select all that apply*)

- ☐ Northeast (1)
- ☐ Mid-Atlantic (2)
- ☐ Southeast (3)
- ☐ West (4)
- ☐ Caribbean (5)
- ☐ Gulf of Mexico (6)
- ☐ Pacific Islands (7)
- ☐ Alaska (8)
- ☐ National (9)

Q4 Does {organization/agency} have a hurricane preparedness/response plan? (choose one)

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Q4 = 1

Q5 Does {organization/agency} hurricane preparedness/response plan include provisions regarding the COVID-19 pandemic?

- Yes (1)
- No (2)

Q6 Did differences between local/state/federal guidelines create challenges for a timely and effective response in 2020 for {organization/agency}?

- Yes (1)
- No (2)

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Q7 Based on the following list of best practices, please select each practice you used during the 2020 hurricane season and if you intend to use that best practice in the 2021 hurricane season.

(*Select all that apply*)

	Used in 2020 (1)	Plan to use in 2021 (2)
Staff were given discretion as to whether or not to deploy/respond (1)	☐	☐
Minimize onscene personnel (2)	☐	☐
Conducted risk assessment prior to each deployment (3)	☐	☐
Temporarily halted routine field operations (4)	☐	☐
Re-assigned tasks to employees (due to limited staff, COVID-19 high risk) (5)	☐	☐
Developed and used new training for staff to respond during a pandemic (i.e., tabletop exercise) (6)	☐	☐
Updated response methods (i.e., remote response, minimize on-scene personnel, limit duration of response) (7)	☐	☐
Developed criteria for deployments in a pandemic (8)	☐	☐
Enhanced communication protocols (for before, during, and post events) (9)	☐	☐
Changed response and recovery activities in a command post(s) (10)	☐	☐
Changed response and recovery activities for field deployments (11)	☐	☐
Other (12)	☐	☐

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Q8 Do you know how to work through FEMA to get access to NOAA and other federal agency expertise?

- Yes (1)
- No (2)

Q9 Do you have a Mission Essential Function (MEF) or Emergency Support Function (ESF) role in hurricane response?

- Yes (1)
- No (2)

Display This Question:

If Q9 = 1

Q10 Please select the ESF's you work under.

(Select all that apply)

- [ ] ESF #1: Transportation (1)
- [ ] ESF #2: Communications (2)
- [ ] ESF #3: Public Works and Engineering (3)
- [ ] ESF #4: Firefighting (4)
- [ ] ESF #5: Information and Planning (5)
- [ ] ESF #6: Mass Care, Emergency Assistance, Temporary Housing, and Human Services (6)
- [ ] ESF #7: Logistics (7)
- [ ] ESF #8: Public Health and Medical Services (8)
- [ ] ESF #9: Search and Rescue (9)
- [ ] ESF #10: Oil and Hazardous Materials Response (10)
- [ ] ESF #11: Agriculture and Natural Resources Annex (11)
- [ ] ESF #12: Energy (12)
- [ ] ESF #13: Public Safety and Security (13)
- [ ] ESF #14: Cross-Sector Business and Infrastructure (14)
- [ ] ESF #15: External Affairs (15)

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Q11 Which of the following do you anticipate as challenges for the 2021 hurricane season? *(Select all that apply)*

	Check if you anticipate this to be a challenge in the 2021 hurricane season (1)	Check if you have found ways to mitigate this challenge (2)
How to keep your people safe and maintain access to adequate protection (PPE, COVID-19 testing, vaccines) during response activities (1)	☐	☐
Having enough qualified personnel to respond (2)	☐	☐
Access to funding to support hurricane response efforts, including additional requirements due to the pandemic (3)	☐	☐
Staff safety during evacuations (4)	☐	☐
Continuity of Operations Planning (COOP) (5)	☐	☐
Return to pre-storm operational activities/capacity (6)	☐	☐
Managing the multiple aspects of pandemic related fatigue (7)	☐	☐
Management of staff and other resource capacity (8)	☐	☐
Unreliability or loss of utilities (power, internet, water, cell service) (9)	☐	☐
Maintaining facilities (10)	☐	☐
Being able to address impacts to tribal, territorial, state and/or federal trust resources (11)	☐	☐
Establishing response guidance (on scene vs remote support) (12)	☐	☐

Agency COVID-19 guidelines and rules differ from state to state (13)	☐	☐
Complacency of others to follow COVID-19 safety guidelines (PPE, social distance, personal hygiene) (14)	☐	☐
Coordinating deployment logistics (i.e., lodging, travel, testing) and response efforts with partners (15)	☐	☐
Coordination with and access to federal and/or state partner programs, representatives, support or services (16)	☐	☐
Loss of partner relationships without face-to-face interactions (17)	☐	☐
Other (please specify) (18)	☐	☐

Carry Forward Selected Choices from "Q11"

Q12 How extensive of a challenge do you anticipate for each of the following for the 2021 hurricane season?

	Substantial Challenge (1)	Moderate Challenge (2)	Minor Challenge (3)
How to keep your people safe and maintain access to adequate protection (PPE, COVID-19 testing, vaccines) during response activities (x1)	○	○	○
Having enough qualified personnel to respond (x2)	○	○	○
Access to funding to support hurricane response efforts, including additional requirements due to the pandemic (x3)	○	○	○
Staff safety during evacuations (x4)	○	○	○
Continuity of Operations Planning (COOP) (x5)	○	○	○
Return to pre-storm operational activities/capacity (x6)	○	○	○
Managing the multiple aspects of pandemic related fatigue (x7)	○	○	○
Management of staff and other resource capacity (x8)	○	○	○
Unreliability or loss of utilities (power, internet, water, cell service) (x9)	○	○	○
Maintaining facilities (x10)	○	○	○
Being able to address impacts to tribal, territorial, state and/or federal trust resources (x11)	○	○	○
Establishing response guidance (on scene vs remote support) (x12)	○	○	○
Agency COVID-19 guidelines and rules differ from state to state (x13)	○	○	○
Complacency of others to follow COVID-19 safety guidelines (PPE, social distance, personal hygiene) (x14)	○	○	○
Coordinating deployment logistics (i.e., lodging, travel, testing) and response efforts with partners (x15)	○	○	○

Coordination with and access to federal and/or state partner programs, representatives, support or services (x16)	○	○	○
Loss of partner relationships without face-to-face interactions (x17)	○	○	○
Other (please specify) (x18)	○	○	○

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Q13 Is there a specific topic you would like addressed in the upcoming NOS Hurricane Preparedness Summit?

_____

_____

_____

_____

_____

End of Block: General Questions

Start of Block: Closing

Q14 Thank you

If you have any questions about the summit, please contact Katie Perry at the Coastal Response Research Center (katie.perry@unh.edu). Thank you very much for taking the time to complete this survey.

Mark the dates for the 2021 NOS Hurricane Preparedness Summit.

If you received this email, you will be receiving a registration invite in the very near future. The 2021 NOS Hurricane Preparedness Summit is planned as a virtual event between 1:00 and 5:00 Eastern Time on 21 and 23 June, 2021.

End of Block: Closing